

=> fil reg

FILE 'REGISTRY' ENTERED AT 17:21:50 ON 30 AUG 2006

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(FILE 'HOME' ENTERED AT 08:19:40 ON 30 AUG 2006)

D SAV

FILE 'REGISTRY' ENTERED AT 08:20:48 ON 30 AUG 2006

ACT WEI272S/A

```
-----
L1      SCR 1918
L2      SCR 1841
L3      SCR 1968 OR 1958 OR 1938 OR 1985
L4      STR
L5      49 SEA SSS SAM L4 NOT (L1 OR L2 OR L3)
-----

L6      STR L4
L7      STR
L8      42 SEA SSS SAM (L6 NOT L7) NOT (L1 OR L2 OR L3)
L9      SCR 1312 OR 1707 OR 1526
L10     36 SEA SSS SAM (L6 NOT L7) NOT (L1 OR L2 OR L3 OR L9)
L11     STR
L12     33 SEA SSS SAM (L6 NOT L7 NOT L11) NOT (L1 OR L2 OR L3 OR
L13     SCR 2026
L14     31 SEA SSS SAM (L6 NOT L7 NOT L11) NOT (L1 OR L2 OR L3 OR
L15     STR
L16     30 SEA SSS SAM (L6 NOT L7 NOT L11 NOT L15) NOT (L1 OR L2 OR
L17     STR
L18     30 SEA SSS SAM (L6 NOT L7 NOT L11 NOT L15 NOT L17) NOT (L1
L19     SCR 1267
L20     25 SEA SSS SAM (L6 NOT L7 NOT L11 NOT L15 NOT L17) NOT (L1
L21     STR L6
L22     20 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17) NOT (L1
L23     SCR 1451 OR 1304 OR 1599 OR 1451 OR 1367 OR 2043
L24     STR
L25     STR L24
L26     SCR 1263 OR 1310 OR 1139 OR 1711 OR 1774 OR 1609 OR 1445
L27     28 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25)
L28     SCR 1199 OR 2016 OR 1481
L29     28 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25)
L30     STR
L31     26 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
L32     SCR 1628 OR 1716 OR 1932 OR 1643 OR 2108
L33     28 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
NOT L30) NOT (L1 OR L2 OR L3 OR L9 OR L13 OR L19 OR L23
```

OR L26 OR L28 OR L32)
 L34 STR
 L35 19 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR L9 OR L13 OR L19
 OR L23 OR L26 OR L28 OR L32)
 L36 SCR 2040
 L37 14 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR L9 OR L13 OR L19
 OR L23 OR L26 OR L28 OR L32 OR L36)
 L38 SCR 1116 OR 1257
 L39 20 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR L9 OR L13 OR L19
 OR L23 OR L26 OR L28 OR L32 OR L38)
 L40 20 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR L9 OR L13 OR L19
 OR L23 OR L26 OR L28 OR L32 OR L38 OR L36)
 L41 9897 SEA SSS SAM (L21 NOT L7 NOT L11 NOT L15 NOT L17 NOT L25
 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR L9 OR L13 OR L19
 OR L23 OR L26 OR L28 OR L32 OR L38 OR L36)
 SAV L41 WEI272F26/A

FILE 'HCAPLUS' ENTERED AT 12:55:45 ON 30 AUG 2006
 E US20040185347/PN

L42 1 SEA US2004185347/PN

FILE 'REGISTRY' ENTERED AT 12:56:30 ON 30 AUG 2006

L43 54 SEA (463-79-6/BI OR 10377-51-2/BI OR 105-58-8/BI OR

L44 5 SEA L43 AND L41

ACT WEI272F1/A

L45 STR
 L46 SCR 2043
 L47 SCR 1064
 L48 37681 SEA SSS FUL L45 AND L47 NOT L46

L49 1 SEA L43 AND L48

L50 STR
 L51 STR
 L52 1 SEA SSS SAM L50
 L53 50 SEA SSS SAM L51
 L54 SCR 1840
 L55 STR L51
 L56 50 SEA SSS SAM L55 NOT L54
 L57 STR L50
 L58 12332 SEA SSS FUL L55 NOT L54
 SAV L58 WEI272F45/A
 L59 STR L50
 L60 50 SEA SSS SAM L59
 L61 50 SEA SSS SAM L59 NOT L54
 L62 50 SEA SSS SAM (L59 NOT L7 NOT L30 NOT L34) NOT (L54 OR L3)
 L63 50 SEA SSS SAM (L59 NOT L7 NOT L30 NOT L34) NOT (L54 OR L3
 OR L9 OR L13 OR L19 OR L23 OR L26 OR L28 OR L32 OR L38
 OR L36)
 L64 50 SEA SSS SAM (L59 NOT L7 NOT L30 NOT L34) NOT (L54 OR L1
 OR L3 OR L9 OR L13 OR L19 OR L23 OR L26 OR L28 OR L32 OR
 L38 OR L36)
 L65 1699 SEA SSS FUL (L59 NOT L7 NOT L30 NOT L34) NOT (L54 OR L1

OR L3 OR L9 OR L13 OR L19 OR L23 OR L26 OR L28 OR L32 OR
L38 OR L36)
SAV L65 WEI272F3/A
L66 STR
L67 50 SEA SUB=L48 SSS SAM (L66 NOT L54)
L68 1222 SEA SUB=L48 SSS FUL (L66 NOT L54)
L69 1 SEA L43 AND L68
SAV WEI272F1S/A L68
L70 STR L21
L71 50 SEA SUB=L41 SSS SAM L70
L72 2634 SEA SUB=L41 SSS FUL L70
SAV L72 WEI272F2S/A
L73 STR L21
L74 50 SEA SUB=L41 SSS SAM L73
L75 2262 SEA SUB=L41 SSS FUL L73
SAV L75 WEI272F6S/A
L76 4 SEA L43 AND L72
L77 1 SEA L43 AND L75
L78 3 SEA L43 AND L65
L79 STR L55
L80 STR L79
L81 17 SEA SUB=L58 SSS SAM L80
L82 288 SEA SUB=L58 SSS FUL L80
SAV L82 WEI272F4S/A
L83 2 SEA L43 AND L82
L84 STR L55
L85 1 SEA SUB=L58 SSS SAM L84
L86 58 SEA SUB=L58 SSS FUL L84
SAV L86 WEI272F5S/A
L87 2 SEA L43 AND L86
L88 928 SEA L68 AND 1/NC
L89 2570 SEA L72 AND 1/NC
L90 1698 SEA L65 AND 1/NC
L91 123 SEA L82 AND 1/NC
L92 25 SEA L86 AND 1/NC
L93 2221 SEA L75 AND 1/NC

Formula

1
2
3
4
5
6

FILE 'HCAPLUS' ENTERED AT 16:21:21 ON 30 AUG 2006

L94 17472 SEA L88
L95 40827 SEA L89
L96 8170 SEA L90
L97 6839 SEA L91
L98 1201 SEA L92
L99 27264 SEA L93

FILE 'REGISTRY' ENTERED AT 16:24:10 ON 30 AUG 2006

L100 1 SEA LITHIUM/CN

FILE 'HCAPLUS' ENTERED AT 16:25:34 ON 30 AUG 2006

L101 81718 SEA L100
L102 474811 SEA ELECTROLY?

FILE 'REGISTRY' ENTERED AT 16:41:10 ON 30 AUG 2006

L103 20881 SEA LITHIUM SALT
L104 4 SEA L43 AND L103

FILE 'HCAPLUS' ENTERED AT 16:42:32 ON 30 AUG 2006

L105 85337 SEA L103 OR (LITHIUM OR LI) (2A) SALT#
L106 238813 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
OR GALVAN? OR WET OR DRY OR PRIMARY OR SECONDARY) (2A) (CEL

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      L OR CELLS)
L107      83 SEA L94 AND L105
L108      6 SEA L107 AND L106
L109      2 SEA L108 AND L101
L110      2 SEA L109 AND L102
L111      6 SEA L108 OR L109 OR L110
L112     708 SEA L95 AND L105
L113      99 SEA L112 AND L106
L114      45 SEA L113 AND L101
L115      40 SEA L114 AND L102
L116      37 SEA L115 AND (1840-2003)/PY,PRY,AY
L117      36 SEA L116 NOT L111
L118      70 SEA L90 AND L105
L119      6 SEA L118 AND L106
L120      2 SEA L119 AND L101
L121      2 SEA L120 AND L102
L122      6 SEA L119 OR L120 OR L121
L123      5 SEA L122 NOT (L111 OR L117)
L124     50 SEA L91 AND L105
L125      2 SEA L124 AND L106
L126      1 SEA L125 AND L101
L127      1 SEA L126 AND L102
L128      2 SEA L125 OR L126 OR L127
L129      0 SEA L128 NOT (L111 OR L117 OR L123)
L130      6 SEA L128 OR L111
L131     11 SEA L92 AND L105
L132      1 SEA L131 AND L106
L133      1 SEA L132 AND L101
L134      1 SEA L133 AND L102
L135      1 SEA L42 AND L134
L136      6 SEA L135 OR L111
L137     460 SEA L93 AND L105
L138      49 SEA L137 AND L106
L139      12 SEA L138 AND L101
L140      11 SEA L139 AND L102
L141      12 SEA L139 OR L140
L142      9 SEA L141 NOT (L136 OR L117 OR L123)

```

=> d l68 que stat

L45 STR

```

      4
      G1      Ak@6      Cb@7
      |
      2
Cb~C~Cb
1  |  3
      |
      G1
      5

```

VAR G1=6/7

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

GGCAT IS UNS AT 1

GGCAT IS UNS AT 3

GGCAT IS SAT AT 6

GGCAT IS UNS AT 7

DEFAULT ECLEVEL IS LIMITED

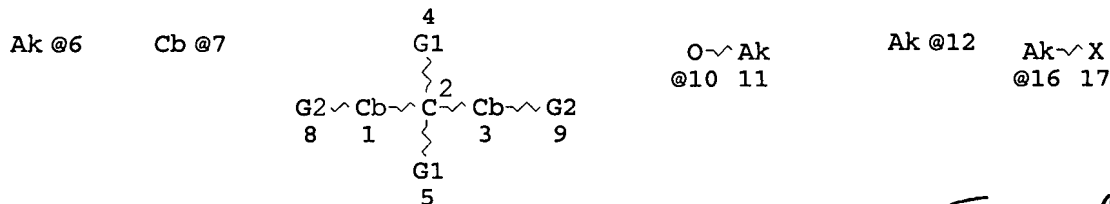
ECOUNT IS E6 C AT 1

ECOUNT IS E6 C AT 3

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE

L46 SCR 2043
L47 SCR 1064
L48 37681 SEA FILE=REGISTRY SSS FUL L45 AND L47 NOT L46
L54 SCR 1840
L66 STR



Formula (1)

O ~ Ak ~ X
@13 14 15

VAR G1=6/7
VAR G2=OH/10/12/16/13
NODE ATTRIBUTES:
CONNECT IS E1 RC AT 6
CONNECT IS E1 RC AT 7
CONNECT IS E1 RC AT 11
CONNECT IS E1 RC AT 12
CONNECT IS E2 RC AT 14
CONNECT IS E2 RC AT 16
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 1
GGCAT IS UNS AT 3
GGCAT IS SAT AT 6
GGCAT IS UNS AT 7
GGCAT IS SAT AT 11
GGCAT IS UNS AT 12
GGCAT IS SAT AT 14
GGCAT IS UNS AT 16
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS E6 C AT 1
ECOUNT IS E6 C AT 3

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 17

STEREO ATTRIBUTES: NONE
L68 1222 SEA FILE=REGISTRY SUB=L48 SSS FUL (L66 NOT L54)

100.0% PROCESSED 11518 ITERATIONS
SEARCH TIME: 00.00.01

1222 ANSWERS

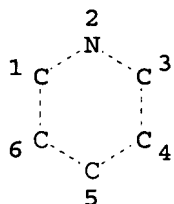
=> d 172 que stat
L1 SCR 1918
L2 SCR 1841
L3 SCR 1968 OR 1958 OR 1938 OR 1985
L7 STR

CN 1

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 1

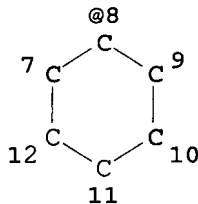
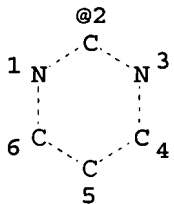
STEREO ATTRIBUTES: NONE
L9 SCR 1312 OR 1707 OR 1526
L11 STR



NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE
L13 SCR 2026
L15 STR

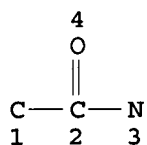


G1 13

VAR G1=2/8
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE
L17 STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

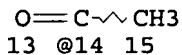
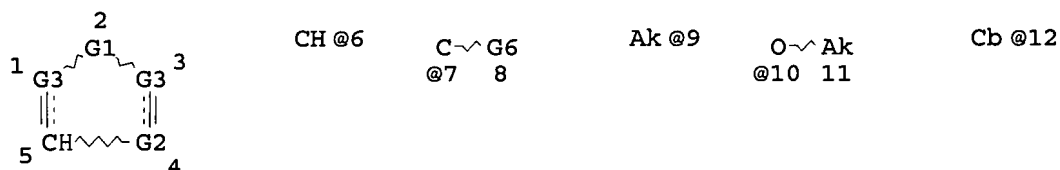
RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 4

STEREO ATTRIBUTES: NONE

L19 SCR 1267

L21 STR



VAR G1=O/N/S

VAR G2=C/N/O/S

VAR G3=6/7

VAR G6=9/10/12/14

NODE ATTRIBUTES:

CONNECT IS E1 RC AT 9

CONNECT IS E1 RC AT 11

CONNECT IS E1 RC AT 12

DEFAULT MLEVEL IS ATOM

GGCAT IS SAT AT 11

GGCAT IS UNS AT 12

DEFAULT ECLEVEL IS LIMITED

ECOUNT IS M1-X8 C AT 9

ECOUNT IS M1-X6 C AT 11

GRAPH ATTRIBUTES:

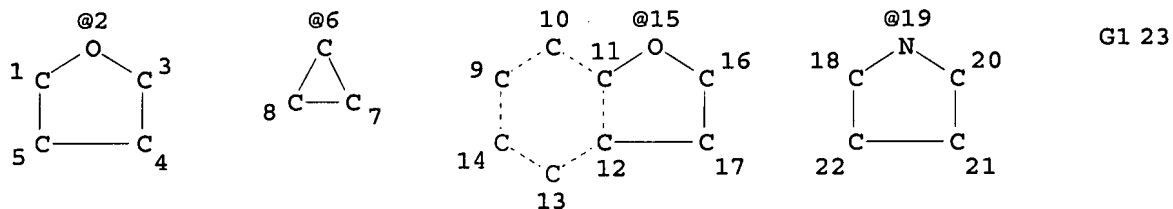
RSPEC I

NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

L23 SCR 1451 OR 1304 OR 1599 OR 1451 OR 1367 OR 2043

L25 STR



VAR G1=2/6/15/19
 NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 23

STEREO ATTRIBUTES: NONE
 L26 SCR 1263 OR 1310 OR 1139 OR 1711 OR 1774 OR 1609 OR 1445
 L28 SCR 1199 OR 2016 OR 1481
 L30 STR

NO2 1

NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 1

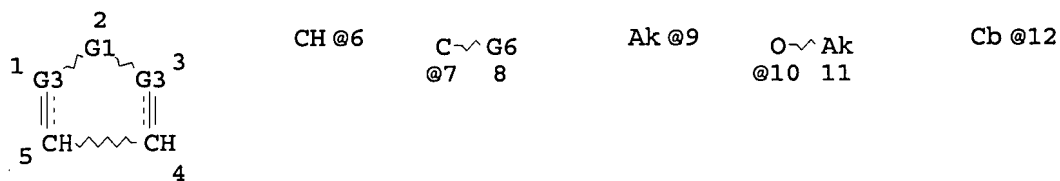
STEREO ATTRIBUTES: NONE
 L32 SCR 1628 OR 1716 OR 1932 OR 1643 OR 2108
 L34 STR

OH 1

NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 1

STEREO ATTRIBUTES: NONE
 L36 SCR 2040
 L38 SCR 1116 OR 1257
 L41 9897 SEA FILE=REGISTRY SSS SAM (L21 NOT L7 NOT L11 NOT L15
 NOT L17 NOT L25 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR
 L9 OR L13 OR L19 OR L23 OR L26 OR L28 OR L32 OR L38 OR
 L36)
 L70 STR



Formula (2)

VAR G1=O/N/S
VAR G3=6/7
VAR G6=9/10/12/14

NODE ATTRIBUTES:

CONNECT IS E1 RC AT 9
CONNECT IS E1 RC AT 11
CONNECT IS E1 RC AT 12
DEFAULT MLEVEL IS ATOM
GGCAT IS SAT AT 11
GGCAT IS UNS AT 12
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS M1-X8 C AT 9
ECOUNT IS M1-X6 C AT 11

GRAPH ATTRIBUTES:

RSPEC I
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

L72 2634 SEA FILE=REGISTRY SUB=L41 SSS FUL L70

100.0% PROCESSED 8903 ITERATIONS
SEARCH TIME: 00.00.01

2634 ANSWERS

=> d 165 que stat

L1 SCR 1918
L3 SCR 1968 OR 1958 OR 1938 OR 1985
L7 STR

CN 1

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 1

STEREO ATTRIBUTES: NONE

L9 SCR 1312 OR 1707 OR 1526
L13 SCR 2026
L19 SCR 1267
L23 SCR 1451 OR 1304 OR 1599 OR 1451 OR 1367 OR 2043

L26 SCR 1263 OR 1310 OR 1139 OR 1711 OR 1774 OR 1609 OR 1445
L28 SCR 1199 OR 2016 OR 1481
L30 STR

NO2 1

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 1

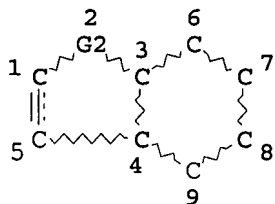
STEREO ATTRIBUTES: NONE
L32 SCR 1628 OR 1716 OR 1932 OR 1643 OR 2108
L34 STR

OH 1

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 1

STEREO ATTRIBUTES: NONE
L36 SCR 2040
L38 SCR 1116 OR 1257
L54 SCR 1840
L59 STR



Formula(3)

VAR G2=O/N/S
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

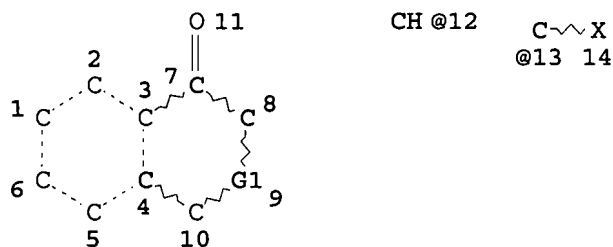
GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE
L65 1699 SEA FILE=REGISTRY SSS FUL (L59 NOT L7 NOT L30 NOT L34)
NOT (L54 OR L1 OR L3 OR L9 OR L13 OR L19 OR L23 OR L26
OR L28 OR L32 OR L38 OR L36)

100.0% PROCESSED 7356 ITERATIONS
SEARCH TIME: 00.00.01

1699 ANSWERS

```
=> d 182 que stat
L54          SCR 1840
L55          STR
```

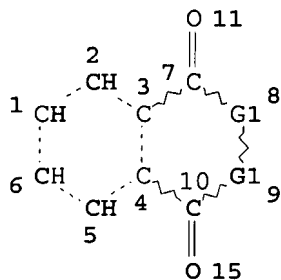


```
VAR G1=12/13
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED
```

```
GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 14
```

```
STEREO ATTRIBUTES: NONE
L58          12332 SEA FILE=REGISTRY SSS FUL L55 NOT L54
L80          STR
```

CH @12 C~X
 @13 14



Formula (4)

```
VAR G1=12/13
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED
```

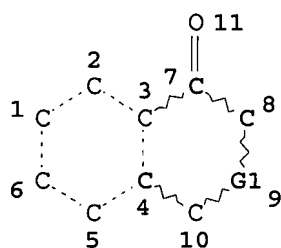
```
GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 15
```

```
STEREO ATTRIBUTES: NONE
L82          288 SEA FILE=REGISTRY SUB=L58 SSS FUL L80
```

```
100.0% PROCESSED      7289 ITERATIONS
SEARCH TIME: 00.00.01
```

288 ANSWERS

```
=> d 186 que stat
L54          SCR 1840
L55          STR
```



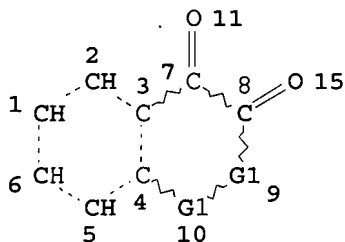
CH@12 C~X
 @13 14

VAR G1=12/13
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 14

STEREO ATTRIBUTES: NONE
L58 12332 SEA FILE=REGISTRY SSS FUL L55 NOT L54
L84 STR

CH@12 C~X
 @13 14



Formula (5)

VAR G1=12/13
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE
L86 58 SEA FILE=REGISTRY SUB=L58 SSS FUL L84

100.0% PROCESSED 2578 ITERATIONS
SEARCH TIME: 00.00.01

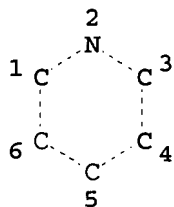
58 ANSWERS

=> d 175 que stat
L1 SCR 1918
L2 SCR 1841
L3 SCR 1968 OR 1958 OR 1938 OR 1985
L7 STR
CN 1

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 1

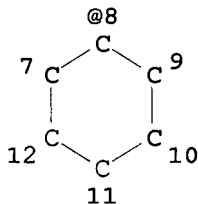
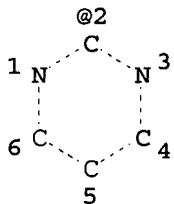
STEREO ATTRIBUTES: NONE
L9 SCR 1312 OR 1707 OR 1526
L11 STR



NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE
L13 SCR 2026
L15 STR

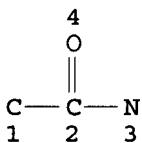


G1 13

VAR G1=2/8
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE
L17 STR



NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM

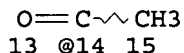
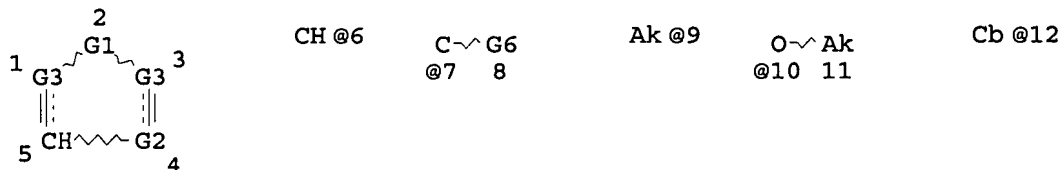
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 4

STEREO ATTRIBUTES: NONE

L19 SCR 1267
L21 STR



VAR G1=O/N/S

VAR G2=C/N/O/S

VAR G3=6/7

VAR G6=9/10/12/14

NODE ATTRIBUTES:

CONNECT IS E1 RC AT 9

CONNECT IS E1 RC AT 11

CONNECT IS E1 RC AT 12

DEFAULT MLEVEL IS ATOM

GGCAT IS SAT AT 11

GGCAT IS UNS AT 12

DEFAULT ECLEVEL IS LIMITED

ECOUNT IS M1-X8 C AT 9

ECOUNT IS M1-X6 C AT 11

GRAPH ATTRIBUTES:

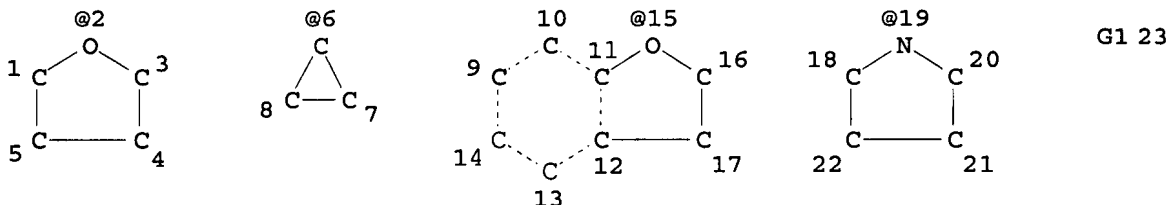
RSPEC I

NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

L23 SCR 1451 OR 1304 OR 1599 OR 1451 OR 1367 OR 2043

L25 STR



VAR G1=2/6/15/19

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 23

STEREO ATTRIBUTES: NONE

L26 SCR 1263 OR 1310 OR 1139 OR 1711 OR 1774 OR 1609 OR 1445

L28 SCR 1199 OR 2016 OR 1481

L30 STR

NO2 1

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 1

STEREO ATTRIBUTES: NONE

L32 SCR 1628 OR 1716 OR 1932 OR 1643 OR 2108

L34 STR

OH 1

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 1

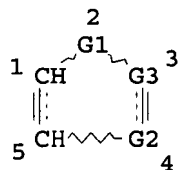
STEREO ATTRIBUTES: NONE

L36 SCR 2040

L38 SCR 1116 OR 1257

L41 9897 SEA FILE=REGISTRY SSS SAM (L21 NOT L7 NOT L11 NOT L15
NOT L17 NOT L25 NOT L30 NOT L34) NOT (L1 OR L2 OR L3 OR
L9 OR L13 OR L19 OR L23 OR L26 OR L28 OR L32 OR L38 OR
L36)

L73 STR



CH @6

C~G6
@7 8

Ak @9

O~Ak
@10 11

Cb @12

Formula (6)

O=C~CH3
13 @14 15

VAR G1=O/N/S

VAR G2=N/O/S

VAR G3=6/7

VAR G6=9/10/12/14

NODE ATTRIBUTES:

CONNECT IS E1 RC AT 9

CONNECT IS E1 RC AT 11

CONNECT IS E1 RC AT 12

DEFAULT MLEVEL IS ATOM
 GGCAT IS SAT AT 11
 GGCAT IS UNS AT 12
 DEFAULT ECLEVEL IS LIMITED
 ECOUNT IS M1-X8 C AT 9
 ECOUNT IS M1-X6 C AT 11

GRAPH ATTRIBUTES:
 RSPEC I
 NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE
 L75 2262 SEA FILE=REGISTRY SUB=L41 SSS FUL L73

100.0% PROCESSED 9897 ITERATIONS 2262 ANSWERS
 SEARCH TIME: 00.00.01

=> fil hcap
 FILE 'HCAPLUS' ENTERED AT 17:25:14 ON 30 AUG 2006
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
 COPYRIGHT (C) 2006 AMERICAN CHEMICAL SOCIETY (ACS)

=> d l136 ibib abs hitstr hitind 1-6

L136 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 2005:394066 HCAPLUS
 DOCUMENT NUMBER: 142:433099
 TITLE: **Electrolyte for rechargeable lithium battery**
 INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
 SOURCE: Eur. Pat. Appl., 50 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1528616	A2	20050504	EP 2004-90417	20041101
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR, IS, YU				
KR 2005041859	A	20050504	KR 2004-65773	20040820
JP 2005142157	A2	20050602	JP 2004-318586	20041101
US 2005142448	A1	20050630	US 2004-980116	200411

CN 1770541 A 20060510 CN 2004-10104744 01
200411
01
PRIORITY APPLN. INFO.: KR 2003-76913 A 200310
31
KR 2004-65773 A 200408
20

OTHER SOURCE(S): MARPAT 142:433099

AB Disclosed is an **electrolyte** for a rechargeable lithium battery including: a first additive having an oxidn. potential of 4.1 to 4.6 V; a second additive having an oxidn. potential of 4.4 to 5.0 V; and a nonaq. org. solvent; and a lithium salt.

IT 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate 90076-65-6 132843-44-8
RL: DEV (Device component use); USES (Uses)
(**electrolyte** for rechargeable lithium battery)

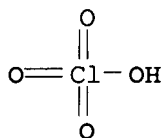
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS

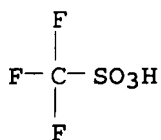
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 33454-82-9 HCAPLUS

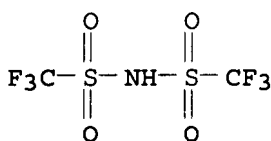
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

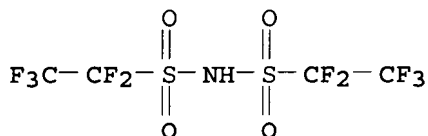
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



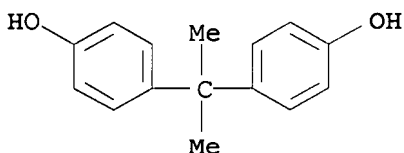
● Li

IT 80-05-7, Bisphenol A, uses

RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte for rechargeable lithium battery)

RN 80-05-7 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38

ST **electrolyte** rechargeable lithium **battery**

IT Alkenes, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (C2-8, copolymer with propylene; **electrolyte** for
 rechargeable lithium **battery**)

IT **Battery electrolytes**
 (**electrolyte** for rechargeable lithium **battery**
)

IT Aromatic hydrocarbons, uses
 Esters, uses
 Ethers, uses
 Ketones, uses
 RL: DEV (Device component use); USES (Uses)
 (**electrolyte** for rechargeable lithium **battery**
)

IT Fluoropolymers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**electrolyte** for rechargeable lithium **battery**
)

IT Styrene-butadiene rubber, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**electrolyte** for rechargeable lithium **battery**
)

IT Secondary **batteries**
 (lithium; **electrolyte** for rechargeable lithium
battery)

IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate 98-95-3,
 Nitrobenzene, uses 105-58-8, Diethyl carbonate 108-32-7,
 Propylene carbonate 108-88-3, Toluene, uses 108-90-7,
 Chlorobenzene, uses 462-06-6, Fluorobenzene 463-79-6D, Carbonic
 acid, ester 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl
 carbonate 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses
 4437-85-8, Butylene carbonate **7439-93-2**, Lithium, uses
 7440-44-0, Carbon, uses 7447-41-8, Lithium chloride, uses
7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide
 12190-79-3, Cobalt lithium oxide (CoLiO₂) 14024-11-4, Lithium
 tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate
 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium
 hexafluorophosphate 25496-08-6, Fluorotoluene 27359-10-0,
 Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl
 carbonate 37220-89-6, Aluminum lithium oxide 56525-42-9, Methyl
 propyl carbonate **90076-65-6 132843-44-8**
 RL: DEV (Device component use); USES (Uses)
 (**electrolyte** for rechargeable lithium **battery**
)

IT 79-41-4D, Methacrylic acid, copolymer with methacrylic alkyl ester
80-05-7, Bisphenol A, uses 80-09-1, Bisphenol S
 106-38-7, 4-Bromotoluene 106-43-4, 4-Chlorotoluene 115-07-1D,
 Propylene, copolymer with C2-8 olefin 352-32-9, 4-Fluorotoluene
 530-48-3, 1,1-Diphenyl ethylene 772-00-9, 4-Phenyl-1,3-dioxane
 843-55-0, 4,4'-Cyclohexylidene bisphenol 1075-20-3,
 4-Phenyl-1,3-dioxolane 1478-61-1, 4,4'-
 (Hexafluoroisopropylidene)diphenol 9000-11-7 9003-39-8,
 Polyvinylpyrrolidone 9004-34-6D, Cellulose, compds. 9004-57-3,
 Ethyl cellulose 9004-62-0 9004-64-2, Hydroxypropyl cellulose
 9004-65-3, Hydroxypropyl methyl cellulose 9004-67-5, Methyl
 cellulose 9062-14-0, Ethyl hydroxypropyl cellulose 10192-62-8,

Bisphenol A diacetate 24937-79-9, PVDF 25549-84-2, Polysodium acrylate

RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for rechargeable lithium **battery**)

IT 9003-55-8

RL: MOA (Modifier or additive use); USES (Uses)
(styrene-butadiene rubber; **electrolyte** for rechargeable lithium **battery**)

L136 ANSWER 2 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:932030 HCAPLUS

DOCUMENT NUMBER: 141:398152

TITLE: Electrolyte solution for secondary lithium **battery** and the **battery**

INVENTOR(S): Kim, Jin Hee; Kim, Jin Sung; Hwang, Sang Moon; Baek, Ho Sung; Kim, Hak Soo

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004311442	A2	20041104	JP 2004-111392	20040405
KR 2004086920	A	20041013	KR 2003-21110	20030403
US 2004259002	A1	20041223	US 2004-817761	20040402
CN 1540794	A	20041027	CN 2004-10038747	20040405
PRIORITY APPLN. INFO.:			KR 2003-21110	A 20030403

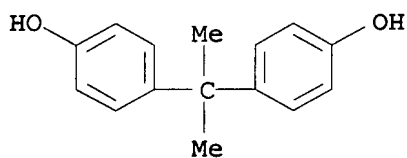
AB The electrolyte soln. contains a **Li salt**, a nonaq. org. solvent, and an additive having a decompn. starting voltage 4-5 V and a const. current in a ≥ 0.5 V wide range on its linear sweep voltammogram. The additive is selected from bisphenol A, 2,5-dimethylfuran, 2,3-dichloro-1,4-naphthoquinone. The **battery** has suppressed gas formation when stored at high temps., and has improved safety when overcharged.

IT 80-05-7, Bisphenol A, uses

RL: MOA (Modifier or additive use); USES (Uses)
(additives in electrolyte solns. in secondary lithium **batteries** for safety and high temp. storing performance)

RN 80-05-7 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium **battery** electrolyte additive safety
IT **Battery** electrolytes
Safety
(electrolyte solns. contg. additives in secondary lithium
batteries for safety and high temp. storing performance)
IT Secondary **batteries**
(lithium; electrolyte solns. contg. additives in secondary
lithium **batteries** for safety and high temp. storing
performance)
IT 80-05-7, Bisphenol A, uses 117-80-6, 2,3-Dichloro-1,4-
naphthoquinone 625-86-5, 2,5-Dimethylfuran
RL: MOA (Modifier or additive use); USES (Uses)
(additives in electrolyte solns. in secondary lithium
batteries for safety and high temp. storing performance)
IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate
21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. contg. additives in secondary lithium
batteries for safety and high temp. storing performance)

L136 ANSWER 3 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

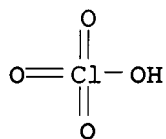
ACCESSION NUMBER: 2004:796490 HCAPLUS
DOCUMENT NUMBER: 141:263480
TITLE: A nonaqueous electrolyte for a lithium secondary
battery
INVENTOR(S): Noh, Hyeong-Gon; Jung, Cheol-Soo; Song, Eui-Hwan
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 25 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1463143	A2	20040929	EP 2003-90265	20030821
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004083670	A	20041006	KR 2003-18226	20030324
JP 2005108440	A2	20050421	JP 2003-183257	20030626

CN 1532986 A 20040929 CN 2003-155677 200309
02
US 2004197667 A1 20041007 US 2003-653192 200309
03
PRIORITY APPLN. INFO.: KR 2003-18226 A 200303
24

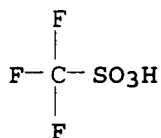
OTHER SOURCE(S): MARPAT 141:263480

AB An electrolyte of a lithium secondary **battery** includes
lithium salts, an org. solvent with a high b.p.,
and a carbonate-based additive compd. having substituents selected
from the group consisting of a halogen, a CN, and a NO2. The
electrolyte improves discharge, low temp., and cycle life
characteristics of a lithium secondary **battery**.
IT 7791-03-9, Lithium perchlorate 33454-82-9, Lithium
triflate 90076-65-6 131651-65-5
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte for lithium secondary **battery**)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



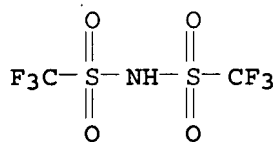
● Li

RN 33454-82-9 HCAPLUS
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX
NAME)



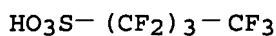
● Li

RN 90076-65-6 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
lithium salt (9CI) (CA INDEX NAME)



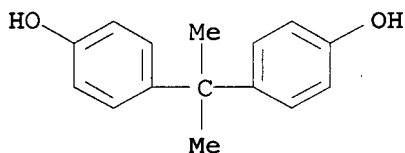
● Li

RN 131651-65-5 HCAPLUS
 CN 1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, lithium salt
 (9CI) (CA INDEX NAME)



● Li

IT 80-05-7, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte for lithium secondary **battery**)
 RN 80-05-7 HCAPLUS
 CN Phenol, 4,4'-(1-methylethylidene)bis- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq electrolyte lithium secondary **battery**
 IT Secondary **batteries**
 (lithium; nonaq. electrolyte for lithium secondary **battery**)
 IT **Battery** electrolytes
 (nonaq. electrolyte for lithium secondary **battery**)
 IT Anhydrides
 Aromatic hydrocarbons, uses
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte for lithium secondary **battery**)
 IT Fluoropolymers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte for lithium secondary **battery**)
 IT Styrene-butadiene rubber, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte for lithium secondary **battery**)
 IT 67-68-5, DmsO, uses 68-12-2, Dmf, uses 71-43-2, Benzene, uses
 75-05-8, Acetonitrile, uses 79-16-3, N-Methylacetamide 96-48-0,
 γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8,
 Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3,

Toluene, uses 123-39-7, n-Methylformamide 126-33-0, Sulfolane 462-06-6, Fluorobenzene 616-38-6, Dimethyl carbonate 616-42-2, Dimethyl sulfite 623-53-0, Methyl ethyl carbonate 623-96-1, Dipropyl carbonate 872-50-4, N-Methylpyrrolidone, uses 1330-20-7, Xylene, uses 4437-85-8, Butylene carbonate 7447-41-8, Lithium chloride, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 12003-67-7, 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 25496-08-6, Fluorotoluene 27359-10-0, TriFluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5 162684-16-4, Lithium manganese nickel oxide

RL: DEV (Device component use); USES (Uses)

(nonaq. electrolyte for lithium secondary **battery**)

IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 80-05-7, uses 104-92-7, 4-Bromoanisole 127-63-9, Phenyl sulfone 452-10-8, 2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9, 4-Fluoroanisole 463-79-6D, Carbonic acid, cyclic ester 620-32-6, Benzyl sulfone 623-12-1, 4-Chloroanisole 1073-05-8, 1,3-Propanediol cyclic sulfate 1120-71-4, Propane sultone 1888-91-1, n-Acetylcaprolactam 1889-59-4, Ethyl vinyl sulfone 2398-37-0, 3-Bromoanisole 2845-89-8, 3-Chloroanisole 3680-02-2, Methyl vinyl sulfone 5535-48-8, Phenyl vinyl sulfone 24937-79-9, PvdF 28452-93-9, Butadiene sulfone 28802-49-5, Dimethylfuran 93343-10-3, 3,5-Difluoroanisole 114435-02-8, Fluoroethylene carbonate 202925-08-4, 3-Chloro-5-fluoroanisole 756901-22-1 756901-23-2

RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. electrolyte for lithium secondary **battery**)

IT 9003-55-8

RL: MOA (Modifier or additive use); USES (Uses)

(styrene-butadiene rubber; nonaq. electrolyte for lithium secondary **battery**)

L136 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:753254 HCAPLUS

DOCUMENT NUMBER: 141:228183

TITLE: A nonaqueous **electrolyte** for lithium secondary **battery**

INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung; Hwang, Sang-Moon; Paik, Meen-Seon; Kim, Hak-Soo

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea; Cheil Industries Inc.

SOURCE: Eur. Pat. Appl., 33 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1458048	A1	20040915	EP 2003-90262	200308

21

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,

PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,
SK

KR 2004080775	A	20040920	KR 2003-15749	200303 13
JP 2005108439	A2	20050421	JP 2003-183239	200306 26
CN 1531134	A	20040922	CN 2003-155332	200308 27
US 2004185347	A1	20040923	US 2003-658272	200309 10
<--				
PRIORITY APPLN. INFO.:		KR 2003-15749	A	200303 13

OTHER SOURCE(S): MARPAT 141:228183

AB An **electrolyte** for a lithium secondary **battery** includes **lithium salts**, a nonaq. org. solvent, and additive compds. The additive compds. added to the **electrolyte** of the present invention decomp. earlier than the org. solvent to form a conductive polymer layer on the surface of a pos. electrode, and prevent decompn. of the org. solvent. Accordingly, the **electrolyte** inhibits gas generation caused by decompn. of the org. solvent at initial charging, and thus reduces an increase of internal pressure and swelling during high temp. storage, and also improves safety of the **battery** during overcharge.

IT 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate

RL: DEV (Device component use); USES (Uses)
(nonaq. **electrolyte** for lithium secondary **battery**)

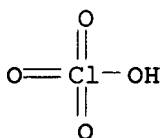
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

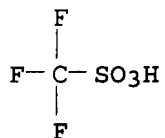
RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



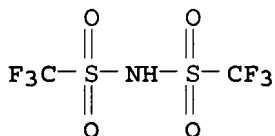
● Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



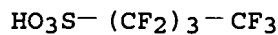
● Li

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

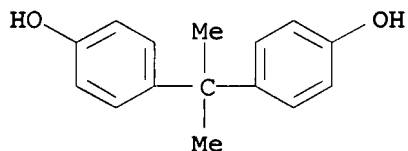
RN 131651-65-5 HCAPLUS
 CN 1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, lithium salt (9CI) (CA INDEX NAME)



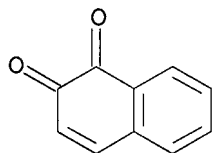
● Li

IT 80-05-7, Bisphenol A, uses 524-42-5,
 1,2-Naphthoquinone 7474-83-1, 3-Bromo-1,2-naphthoquinone
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. **electrolyte** for lithium secondary
battery)

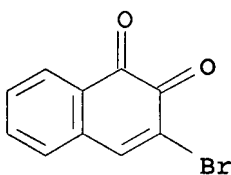
RN 80-05-7 HCAPLUS
 CN Phenol, 4,4'-(1-methylethylidene)bis- (9CI) (CA INDEX NAME)



RN 524-42-5 HCAPLUS
 CN 1,2-Naphthalenedione (9CI) (CA INDEX NAME)



RN 7474-83-1 HCAPLUS
 CN 1,2-Naphthalenedione, 3-bromo- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq **electrolyte** lithium secondary **battery**;
 safety nonaq **electrolyte** lithium secondary **battery**
 IT Secondary **batteries**
 (lithium; nonaq. **electrolyte** for lithium secondary
battery)
 IT **Battery electrolytes**
 Conducting polymers
 Safety
 Swelling, physical
 (nonaq. **electrolyte** for lithium secondary
battery)
 IT Aromatic hydrocarbons, uses
 Esters, uses
 Ethers, uses
 Ketones, uses
 RL: DEV (Device component use); USES (Uses)
 (nonaq. **electrolyte** for lithium secondary
battery)
 IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (nonaq. **electrolyte** for lithium secondary
battery)
 IT 67-71-0, Methylsulfone 71-43-2, Benzene, uses 77-77-0,
 Vinylsulfone 96-49-1, Ethylene carbonate 105-58-8, Diethyl
 carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses
 126-33-0, Tetramethylene sulfone 127-63-9, Phenylsulfone
 462-06-6, Fluorobenzene 463-79-6D, Carbonic acid, chain ester
 463-79-6D, Carbonic acid, cyclic ester 463-79-6D, Carbonic acid,
 ester 616-38-6, Dimethyl carbonate 620-32-6, Benzylsulfone
 623-53-0, Methyl ethyl carbonate 623-96-1, Dipropyl carbonate
 1330-20-7, Xylene, uses 1889-59-4, Ethylvinylsulfone 3680-02-2,
 Methylvinylsulfone 4437-85-8, Butylene carbonate 5535-43-3,
 m-ChloroPhenyl vinyl sulfone 5535-48-8, Phenylvinylsulfone
 7439-93-2, Lithium, uses 7447-41-8, Lithium chloride

(LiCl), uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14024-11-4, Aluminum lithium chloride AlLiCl₄ 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 28122-14-7, p-FluoroPhenyl vinyl sulfone 28452-93-9, Butadiene sulfone 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 37220-89-6, Aluminum lithium oxide 39300-70-4, Lithium nickel oxide 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate 162684-16-4, Lithium manganese nickel oxide

RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte for lithium secondary battery)

IT 80-05-7, Bisphenol A, uses 95-15-8, Thianaphthene 117-80-6, 2,3-Dichloro-1,4-naphthoquinone 271-89-6, 2,3-Benzofuran 524-42-5, 1,2-Naphthoquinone 625-86-5, 2,5-Dimethylfuran 693-98-1, 2-Methylimidazole 1192-62-7, 2-Acetylfuran 1193-79-9, 2-Acetyl-5-methylfuran 4265-27-4, 2-Butylbenzofuran 7474-83-1, 3-Bromo-1,2-naphthoquinone 13243-65-7, 2,3-Dibromo-1,4-naphthoquinone 16851-82-4, 1-(Phenylsulfonyl)pyrrole

RL: MOA (Modifier or additive use); USES (Uses)
(nonaq. electrolyte for lithium secondary battery)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L136 ANSWER 5 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:847742 HCAPLUS
DOCUMENT NUMBER: 136:9010
TITLE: Solid polymer electrolyte
INVENTOR(S): Ogawa, Noriyoshi; Kanekawa, Tatsuya
PATENT ASSIGNEE(S): Mitsubishi Gas Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

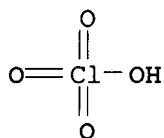
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001325990	A2	20011122	JP 2000-141683	20000515
PRIORITY APPLN. INFO.:				20000515

GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

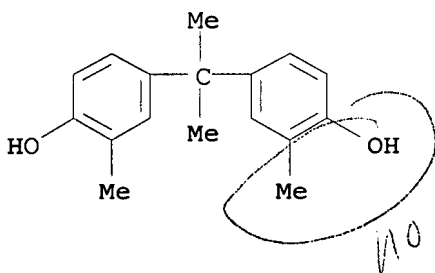
AB The electrolyte contains an ionizable Group I or Group II metal salt and a copolymer, having limiting viscosity 0.2-2.0 dL/g, and contg. repeating units I (R1-4 = H, C1-10 alkyl, C6-12 aryl, C2-5 alkenyl, C1-5 alkoxy, or C7-17 aralkyl groups and may have C1-5 alkyl, C2-5 alkenyl, or C1-5 alkoxy substituents; X = -(CR5R6)n-, -S-, -SO2-, -O-, -CO-, -SO-, II, or III; R5-6 = H, C1-10 alkyl, C6-12 aryl, C2-5 alkenyl, or C1-5 alkoxy groups that may contain C1-5 alkyl, C2-5 alkenyl or C1-5 alkoxy substituents, or R5 and R6 joined to form a (heterocyclic) ring; R7-8 = H, C1-10 alkyl, C2-10 alkenyl, C1-10 alkoxy, or C6-12 aryl group; a = 0-20 integer) and 20-70 mol% IV (R9-10 = H, C1-5 alkyl, C6-12 aryl, C2-5 alkenyl, C1-5 alkoxy, C7-17 aralkyl groups and may have C1-5 alkyl, C2-5 alkenyl, or C1-5 alkoxy substituents; R11-14 = H, C1-5 alkyl, C6-12 aryl, C2-5 alkenyl, C1-5 alkoxy, C7-17 aralkyl groups and may have C1-5 alkyl, C2-5 alkenyl, or C1-5 alkoxy substituents; R15 = C1-6 alkylene group, alkylidene group, or single bond; Y = polymer or random copolymer of -SiR16R17O- and/or -SiR18R19O- having d.p. 0-200, R16-19 = H, C1-5 alkyl, C6-12 aryl, C2-5 alkenyl, C1-5 alkoxy, C7-17 aralkyl groups and may have C1-5 alkyl, C2-5 alkenyl, or C1-5 alkoxy substituents). The electrolyte is useful for **batteries**.

IT 7791-03-9, Lithium perchlorate
 RL: DEV (Device component use); USES (Uses)
 (compns. of solid polymer electrolyte contg. carbonate ester-siloxane copolymer for secondary lithium **batteries**)
)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

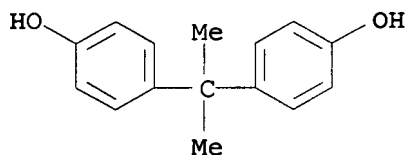


● Li

IT 79-97-0, 2,2-Bis(4-hydroxy-3-methylphenyl)propane
 80-05-7, 2,2-Bis(4-hydroxyphenyl)propane, processes
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (in manuf. of solid polymer electrolyte contg. carbonate ester-siloxane copolymer for secondary lithium **batteries**)
)
 RN 79-97-0 HCAPLUS
 CN Phenol, 4,4'-(1-methylethylidene)bis[2-methyl- (9CI) (CA INDEX NAME)]



RN 80-05-7 HCAPLUS
 CN Phenol, 4,4'-(1-methylethylidene)bis- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
 ICS C08G064-04; C08K003-00; C08L069-00; H01B001-06
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery** carbonate siloxane copolymer electrolyte compn
 IT **Battery** electrolytes
 (comps. of solid polymer electrolyte contg. carbonate
 ester-siloxane copolymer for secondary lithium **batteries**
)
 IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
 7791-03-9, Lithium perchlorate 158626-68-7 163111-96-4
 375369-96-3 375369-98-5
 RL: DEV (Device component use); USES (Uses)
 (comps. of solid polymer electrolyte contg. carbonate
 ester-siloxane copolymer for secondary lithium **batteries**
)
 IT 75-44-5, Phosgen 79-97-0, 2,2-Bis(4-hydroxy-3-
 methylphenyl)propane 80-05-7, 2,2-Bis(4-
 hydroxyphenyl)propane, processes 843-55-0, 1,1-Bis(4-
 hydroxyphenyl)cyclohexane 1571-75-1, 1,1-Bis(4-hydroxyphenyl)-1-
 phenyl ethane 7775-14-6, Sodium hydrosulfite 27955-94-8,
 1,1,1-Tris(4-hydroxyphenyl)ethane 88938-12-9, 9,9-Bis(4-hydroxy-3-
 methylphenyl)fluorene 158167-48-7
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (in manuf. of solid polymer electrolyte contg. carbonate
 ester-siloxane copolymer for secondary lithium **batteries**
)

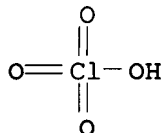
L136 ANSWER 6 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1992:110013 HCAPLUS
 DOCUMENT NUMBER: 116:110013
 TITLE: Ionic conductivity of epoxy network/polyethylene
 glycol-lithium perchlorate complex IPN system
 AUTHOR(S): Peng, Xincheng; Song, Yongxian; Qi, Yuchen; Wu,
 Shuyun; Li, Lixia; Chen, Donglin
 CORPORATE SOURCE: Changchun Inst. Appl. Chem., Acad. Sin.,
 Changchun, Peop. Rep. China
 SOURCE: Chinese Journal of Polymer Science (1990), 8(4),
 342-6
 CODEN: CJPSEG; ISSN: 0256-7679
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB To prep. a polymeric solid electrolyte with both high ionic cond. at
 ambient temp. and adequate mech. strength, an ionic conducting IPN
 (interpenetrating networks) composed of bisphenol A epoxy
 resin/polyethylene glycol contg. LiClO₄ was synthesized. The
 dependence of cond. was investigated as a function of salt content,
 compn., and temp. A max. of cond. appeared when EO/Li = 25, where
 EO denotes the -CH₂CH₂O- unit in polyethylene glycol. The temp.
 dependence of cond. followed Vogel-Tammann-Fulcher equation, using

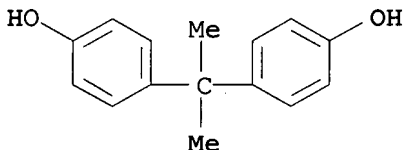
that the motion of ionic carriers resulted from the segmental motion of the polymer. When glycerol epoxy resin was used instead of bisphenol A epoxy, the ambient temp. (25) cond. could somewhat further be raised 3×10^{-5} S/cm.

IT 7791-03-9, Lithium perchlorate
 RL: USES (Uses)
 (interpenetrating network contg. epoxy resins and, ionic cond. of)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 80-05-7D, epoxy resin
 RL: USES (Uses)
 (interpenetrating network contg., ionic cond. of)
 RN 80-05-7 HCAPLUS
 CN Phenol, 4,4'-(1-methylethylidene)bis- (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 37, 38, 76
 ST ionic cond epoxy interpenetrating network; polyethylene glycol interpenetrating network epoxy; lithium perchlorate interpenetrating network epoxy; battery polymer electrolyte interpenetrating network epoxy
 IT Battery electrolytes
 (epoxy network/polyethylene glycol-lithium perchlorate system, ionic cond. of)
 IT 7791-03-9, Lithium perchlorate 25322-68-3
 RL: USES (Uses)
 (interpenetrating network contg. epoxy resins and, ionic cond. of)
 IT 56-81-5D, Glycerol, epoxy resin 80-05-7D, epoxy resin
 RL: USES (Uses)
 (interpenetrating network contg., ionic cond. of)

=> d l117 ibib abs hitstr hitind 1-36

L117 ANSWER 1 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 2006:657261 HCAPLUS
 DOCUMENT NUMBER: 145:127575

TITLE: Long life lithium **batteries** with
stabilized electrodes
INVENTOR(S): Amine, Khalil; Liu, Jun; Vissers, Donald R.; Lu,
Wenquan
PATENT ASSIGNEE(S): The University of Chicago, USA
SOURCE: U.S. Pat. Appl. Publ., 21 pp., Cont.-in-part of
U.S. Ser. No. 857,365.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
US 2006147809	A1	20060706	US 2006-338902	200601 24
US 2005019670	A1	20050127	US 2004-857365	200405 28
<--				
PRIORITY APPLN. INFO.:			US 2004-857365	A2 200405 28
			US 2005-647361P	P 200501 26
			US 2003-488063P	P 200307 17

AB The present invention relates to non-aq. **electrolytes** having electrode stabilizing additives, stabilized electrodes, and electrochem. devices contg. the same. Thus the present invention provides **electrolytes** contg. an alkali metal salt, a polar aprotic solvent, and an electrode stabilizing additive. In certain **electrolytes**, the alkali metal salt is a bis(chelato)borate and the additives include substituted or unsubstituted linear, branched or cyclic hydrocarbons comprising at least one oxygen atom and at least one aryl, alkenyl or alkynyl group. In other **electrolytes**, the additives include a substituted aryl compd. or a substituted or unsubstituted heteroaryl compd. wherein the additive comprises at least one oxygen atom. There are also provided methods of making the **electrolytes** and **batteries** employing the **electrolytes**. The invention also provides for electrode materials. Cathodes of the present invention may be further stabilized by surface coating the particles of the spinel or olivine with a material that can neutralize acid or otherwise lessen or prevent leaching of the manganese or iron ions. In some embodiments the coating is polymeric and in other embodiments the coating is a metal oxide such as ZrO₂, TiO₂, ZnO, WO₃, Al₂O₃, MgO, SiO₂, SnO₂, AlPO₄, Al(OH)₃, a mixt. of any two or more thereof.

IT 7439-93-2D, Lithium, alkyl fluorophosphate 7791-03-9
, Lithium perchlorate 15365-14-7, Iron lithium phosphate
feliPo4 33454-82-9, Lithium triflate 90076-65-6

132843-44-8

RL: DEV (Device component use); USES (Uses)
(long life lithium **batteries** with stabilized
electrodes)

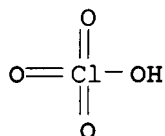
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS

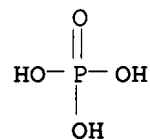
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 15365-14-7 HCAPLUS

CN Phosphoric acid, iron(2+) lithium salt (1:1:1) (9CI) (CA INDEX NAME)

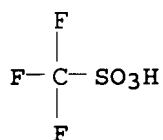


● Fe(II)

● Li

RN 33454-82-9 HCAPLUS

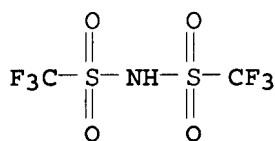
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

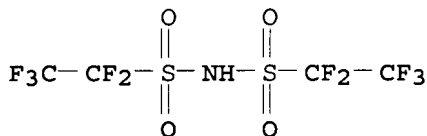
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)

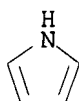


● Li

IT 109-97-7D, Pyrrole, aryloxy derivs. 110-00-9D,
Furan, aryloxy derivs. 897381-31-6 897381-39-4
897381-44-1RL: MOA (Modifier or additive use); USES (Uses)
(long life lithium **batteries** with stabilized
electrodes)

RN 109-97-7 HCAPLUS

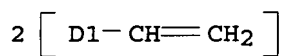
CN 1H-Pyrrole (9CI) (CA INDEX NAME)



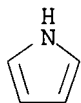
RN 110-00-9 HCAPLUS
CN Furan (7CI, 8CI, 9CI) (CA INDEX NAME)



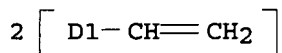
RN 897381-31-6 HCAPLUS
CN Furan, diethenyl- (9CI) (CA INDEX NAME)



RN 897381-39-4 HCAPLUS
CN 1H-Pyrrole, diethenylmethoxy- (9CI) (CA INDEX NAME)



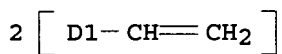
D1-O-Me



RN 897381-44-1 HCAPLUS
CN Furan, diethenylmethoxy- (9CI) (CA INDEX NAME)



D1-O-Me



INCL 429326000; 429330000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **battery** stabilized electrode
IT Hydrocarbons, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cyclic; long life lithium **batteries** with stabilized electrodes)
IT Cyclic compounds
RL: MOA (Modifier or additive use); USES (Uses)
(hydrocarbons; long life lithium **batteries** with stabilized electrodes)
IT Secondary **batteries**
(lithium; long life lithium **batteries** with stabilized electrodes)
IT **Battery** electrodes
(long life lithium **batteries** with stabilized electrodes)
IT Coating materials
(surface; long life lithium **batteries** with stabilized electrodes)
IT 60-29-7, Diethyl ether, uses 79-20-9, Methyl acetate 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-60-4, Propyl acetate 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7439-93-2D, Lithium, alkyl fluorophosphate 7791-03-9, Lithium perchlorate 12031-95-7, Lithium titanium oxide (Li₄Ti₅O₁₂) 14283-07-9, Lithium tetrafluoroborate 15365-14-7, Iron lithium phosphate FePO₄ 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 61179-01-9, Aluminum lithium manganese oxide 90076-65-6 132404-42-3 132843-44-8 244761-29-3, Lithium bisoxalatoborate 346417-97-8, Cobalt lithium manganese nickel oxide (Co_{0.33}LiMn_{0.33}Ni_{0.33}O₂) 409071-16-5 678966-16-0
RL: DEV (Device component use); USES (Uses)
(long life lithium **batteries** with stabilized electrodes)
IT 84-15-1D, o-Terphenyl, aryloxy derivs. 86-74-8D, Carbazole, aryloxy derivs. 88-12-0, 1-Vinylpyrrolidin-2-one, uses 91-22-5D, Quinoline, aryloxy derivs. 101-84-8, Diphenyl ether 101-84-8D, Diphenyl ether, aryloxy derivs. 102-09-0, Diphenyl carbonate 102-09-0D, Phenyl carbonate, aryloxy derivs. 106-92-3, Allyl glycidyl ether 109-93-3, Divinyl ether 109-97-7D, Pyrrole, aryloxy derivs. 109-99-9D, Tetrahydrofuran, aryloxy derivs. 110-00-9D, Furan, aryloxy derivs. 110-89-4D, Piperidine, aryloxy derivs. 111-34-2, Butyl vinyl ether 120-92-3D, Cyclopentanone, aryloxy derivs. 140-67-0, 4-Allylanisole 142-96-1D, Butyl ether, aryloxy derivs. 176-53-4D, Ethylene silicate, aryloxy derivs. 288-32-4D, Imidazole, aryloxy derivs. 289-80-5D, Pyridazine, aryloxy derivs. 290-37-9D, Pyrazine, aryloxy derivs. 291-37-2D, Cyclotriphosphazene, Vinyl contg. derivs. 291-37-2D, Cyclotriphosphazene, aryloxy derivs. 503-30-0D, Oxetane, aryloxy derivs. 614-99-3D, Ethyl-2-furoate, aryloxy derivs. 930-22-3 1072-53-3D, Ethylene sulfate, aryloxy derivs. 1917-10-8, Vinyl-2-furoate 3724-65-0D, Crotonic acid, aryloxy derivs. 3741-38-6D, Ethylene sulfite, aryloxy derivs. 4245-37-8, Vinyl methacrylate 4370-23-4, 1-Vinylpiperidin-2-one 4427-96-7, Vinyl ethylene carbonate 5009-27-8D, Cyclopropanone, aryloxy derivs. 6622-92-0, 2,4-Dimethyl-6-hydroxy-pyrimidine 7570-02-7, DiVinyl

carbonate 12789-45-6, Methyl phosphate 14265-44-2D, Phosphate, aryloxy derivs. 14861-06-4, Vinyl crotonate 15896-04-5 16053-89-7D, 2-Furancarboxylate, aryloxy derivs. 16410-02-9 18358-13-9D, Methacrylate, aryloxy derivs. 21994-23-0 23462-75-1, Dihydropyran-3-one 32893-16-6 33879-62-8, 2-Vinyloxetane 36885-49-1, Vinyl phosphate 37203-76-2, Ethyl phosphate 37275-48-2D, Bipyridine, methoxy vinyl derivs. 44414-27-9 50337-14-9, 3-Vinylcyclopentanone 53627-36-4, β -Vinyl- γ -butyrolactone 57453-76-6 61548-40-1 66166-61-8, 3-Vinylcyclobutanone 66281-16-1 66956-76-1 72607-84-2 104531-81-9 117823-03-7 121712-01-4 139669-84-4 557084-91-0 856785-12-1 866947-06-0 897028-07-8 897028-08-9 897028-09-0 897028-10-3 897028-11-4 897028-12-5 897028-13-6 897028-14-7 897028-15-8 897028-16-9 897028-17-0 897028-18-1 897028-19-2 897028-20-5 897028-21-6 897028-22-7 897028-23-8 897028-24-9 897028-25-0 897028-26-1 897028-27-2 897028-28-3 897381-27-0 897381-28-1 897381-29-2 897381-30-5 897381-31-6 897381-32-7 897381-33-8 897381-34-9 897381-35-0 897381-36-1 897381-37-2 897381-38-3 897381-39-4 897381-40-7 897381-41-8 897381-42-9 897381-43-0 897381-44-1 897381-45-2 897381-46-3 897381-47-4

RL: MOA (Modifier or additive use); USES (Uses)
(long life lithium **batteries** with stabilized electrodes)

IT 1309-48-4, Magnesium oxide (MgO), uses 1314-13-2, Zinc oxide (ZnO), uses 1314-23-4, Zirconia, uses 1314-35-8, Tungsten trioxide, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 7784-30-7, Aluminum phosphate alpo4 13463-67-7, Titania, uses 18282-10-5, Tin dioxide 21645-51-2, Aluminum hydroxide, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(long life lithium **batteries** with stabilized electrodes)

L117 ANSWER 2 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:431288 HCAPLUS
DOCUMENT NUMBER: 142:484779
TITLE: **Battery having electrolyte**
including one or more additives
INVENTOR(S): Yoon, Sang Young; Nakahara, Hiroshi; Amine, Khalil
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 31 pp., Cont.-in-part of U.S. Ser. No. 496,231, CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 11
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005106470	A1	20050519	US 2004-962125	20041007
WO 2003083970	A1	20031009	WO 2003-US2127	20030122

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 SN, TD, TG

WO 2003083971 A1 20031009 WO 2003-US2128

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 SN, TD, TG

WO 2003083974 A1 20031009 WO 2003-US8783

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US 2004248014 A1 20041209 US 2004-810081

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US 2005019656 A1 20050127 US 2004-496231

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US 2005170253 A1 20050804 US 2004-971912

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PRIORITY APPLN. INFO.:

WO 2003-US2127

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WO 2003-US2128

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US 2003-451065P	P	200302 26
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US 2004-543898P	P	200402 11
US 2004-543951P	P	200402 11
US 2004-810019	A2	200403 25
US 2004-810080	A2	200403 25
US 2004-810081	A2	200403 25
US 2004-563848P	P	200404 19
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US 2004-563850P	P	200404 19
US 2004-563852P	P	200404 19
US 2004-565211P	P	200404 22
US 2004-496231	A2	200405 20
US 2004-601452P	P	200408

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 US 2002-104352 A 200203
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 US 2002-167940 A 200206
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 US 2003-443892P P 200301
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 US 2003-446848P P 200302
 11
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 US 2003-502017P P 200309
 10
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 US 2004-606340P P 200409
 01

AB A **battery** includes an **electrolyte** activating one or more anodes and one or more cathodes. The **electrolyte** includes one or more salts and one or more additives in a solvent. The solvent includes a silane or a siloxane. The one or more additives form a passivation layer on at least one of the anodes. In some instances, the additives include vinyl carbonate and/or vinyl ethylene carbonate.

IT 556-65-0, Lithium thiocyanate 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate 90076-65-6 115028-88-1 132843-44-8 345891-32-9

RL: DEV (Device component use); USES (Uses)
 (battery having electrolyte including one or more additives)

RN 556-65-0 HCAPLUS

CN Thiocyanic acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

HS-C \equiv N

● Li

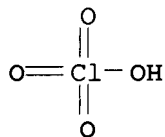
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

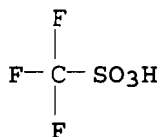
RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



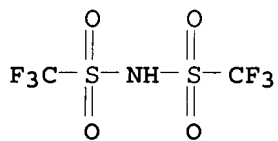
● Li

RN 33454-82-9 HCAPLUS
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



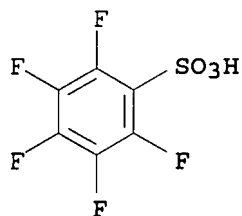
● Li

RN 90076-65-6 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



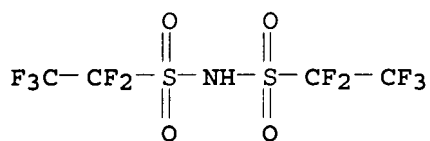
● Li

RN 115028-88-1 HCAPLUS
CN Benzenesulfonic acid, pentafluoro-, lithium salt (9CI) (CA INDEX NAME)



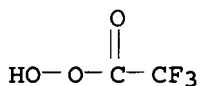
● Li

RN 132843-44-8 HCAPLUS
 CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-
 [(pentafluoroethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



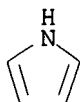
● Li

RN 345891-32-9 HCAPLUS
 CN Ethaneperoxoic acid, trifluoro-, lithium salt (9CI) (CA INDEX NAME)



● Li

IT 29992-75-4
 RL: MOA (Modifier or additive use); USES (Uses)
 (battery having electrolyte including one or
 more additives)
 RN 29992-75-4 HCAPLUS
 CN 1H-Pyrrole, ethenyl- (9CI) (CA INDEX NAME)



D1-CH=CH₂

IC ICM H01M010-40
ICS H01M002-16
INCL 429324000; 429137000; 429328000; 429330000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **battery electrolyte** additive
IT Passivation
(anode; **battery** having **electrolyte** including one or more additives)
IT **Battery electrolytes**
Primary **batteries**
Secondary **batteries**
(**battery** having **electrolyte** including one or more additives)
IT Carbon fibers, uses
Carbonaceous materials (technological products)
RL: DEV (Device component use); USES (Uses)
(**battery** having **electrolyte** including one or more additives)
IT Polyoxyalkylenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**battery** having **electrolyte** including one or more additives)
IT Polysiloxanes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**battery** having **electrolyte** including one or more additives)
IT 556-65-0, Lithium thiocyanate 917-54-4, Lithium methide
7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 9002-88-4, Polyethylene 12135-01-2, Lithium imide 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27208-14-6, Tetrasiloxane 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6
115028-88-1 132404-42-3 132843-44-8
193214-24-3, Aluminum cobalt lithium nickel oxide (Al_{0.05}Co_{0.15}LiNi_{0.80}O₂) 195144-63-9, Lithium oxide (Li₂O)
244761-29-3, Lithium bisoxalatoborate 345891-32-9
RL: DEV (Device component use); USES (Uses)
(**battery** having **electrolyte** including one or more additives)
IT 463-79-6D, Carbonic acid, arom. ester 463-79-6D, Carbonic acid, cyclic ester 463-79-6D, Carbonic acid, vinyl ester 513-81-5
1337-81-1, Vinyl pyridine 1469-73-4, Propylene sulfite 3741-38-6, Ethylene sulfite 4427-92-3, Phenyl ethylene carbonate 4427-96-7, Vinyl ethylene carbonate 7570-02-7 7803-62-5, Silane, uses 13940-57-3, Trisiloxane 16761-08-3 27306-78-1

29992-75-4 30676-86-9 71437-41-7 851904-00-2
851904-03-5

RL: MOA (Modifier or additive use); USES (Uses)
(battery having electrolyte including one or
more additives)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)
(beads; battery having electrolyte including
one or more additives)

IT 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)
(flakes; battery having electrolyte including
one or more additives)

IT 7664-38-2D, Phosphoric acid, fluorinated, alkyl ester

RL: DEV (Device component use); USES (Uses)
(fluoro, lithium, alkyl; battery having
electrolyte including one or more additives)

L117 ANSWER 3 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:283756 HCAPLUS

DOCUMENT NUMBER: 142:358036

TITLE: Nonaqueous lithium secondary battery
with improved cyclability and/or high
temperature safety

INVENTOR(S): Ryu, Duk-Hyun; Lee, Jae-Hyun; Jeong, Jun-Yong;
Yeon, Jin-Hee; Jang, Min-Chul; Koo, Chang-Wan;
Shin, Sun-Wik; Ku, Cha-Hun; Lee, Han-Ho

PATENT ASSIGNEE(S): Lg Chem, Ltd., S. Korea

SOURCE: PCT Int. Appl., 20 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2005029632	A1	20050331	WO 2004-KR2399	200409 20

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CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,
VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,
AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,
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PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
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US 2005100786	A1	20050512	US 2004-944572	200409 17
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CA 2538605	AA	20050331	CA 2004-2538605	200409
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EP 1671393

A1

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EP 2004-774658

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK

PRIORITY APPLN. INFO.:

KR 2003-65169

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WO 2004-KR2399

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AB The present invention provides: (i) a nonaq. **electrolyte** for **batteries**, which is characterized by contg. halogen; (ii) a nonaq. **electrolyte** for **batteries**, which is characterized by contg. pyrrol or its deriv. and halogen; and (iii) a lithium secondary **battery** which is characterized by including the nonaq. **electrolyte** (i) or (ii). The inventive lithium secondary **battery** has improvements in charge/discharge and cycle life characteristics at ambient and high temps., and/or storage characteristics and safety at high temp.

IT 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)
(nonaq. lithium secondary **battery** with improved cyclability and/or high temp. safety)

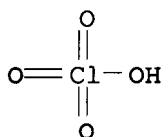
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS

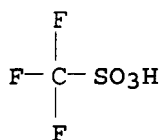
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 33454-82-9 HCAPLUS

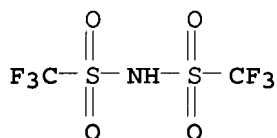
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



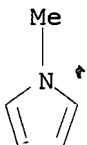
● Li

IT 96-54-8, n-Methylpyrrole 109-97-7, Pyrrole
 109-97-7D, Pyrrole, deriv. 625-84-3,
 2,5-Dimethylpyrrole 932-16-1, 2-Acetyl n-methylpyrrole
 1072-83-9, 2-Acetylpyrrole

RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. lithium secondary **battery** with improved
 cyclability and/or high temp. safety)

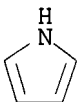
RN 96-54-8 HCAPLUS

CN 1H-Pyrrole, 1-methyl- (9CI) (CA INDEX NAME)



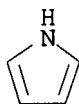
RN 109-97-7 HCAPLUS

CN 1H-Pyrrole (9CI) (CA INDEX NAME)

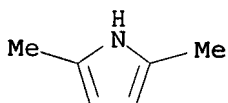


RN 109-97-7 HCAPLUS

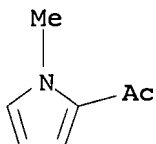
CN 1H-Pyrrole (9CI) (CA INDEX NAME)



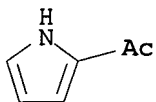
RN 625-84-3 HCAPLUS
 CN 1H-Pyrrole, 2,5-dimethyl- (9CI) (CA INDEX NAME)



RN 932-16-1 HCAPLUS
 CN Ethanone, 1-(1-methyl-1H-pyrrol-2-yl)- (9CI) (CA INDEX NAME)



RN 1072-83-9 HCAPLUS
 CN Ethanone, 1-(1H-pyrrol-2-yl)- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq lithium secondary **battery** improved cyclability;
 safety improvement nonaq lithium secondary **battery**
 IT Transition metal oxides
 RL: DEV (Device component use); USES (Uses)
 (lithium-contg.; nonaq. lithium secondary **battery** with
 improved cyclability and/or high temp. safety)
 IT Secondary **batteries**
 (lithium; nonaq. lithium secondary **battery** with
 improved cyclability and/or high temp. safety)
 IT **Battery electrolytes**
 Safety
 (nonaq. lithium secondary **battery** with improved
 cyclability and/or high temp. safety)
 IT Alloys, uses
 RL: DEV (Device component use); USES (Uses)
 (nonaq. lithium secondary **battery** with improved
 cyclability and/or high temp. safety)
 IT Halogens
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. lithium secondary **battery** with improved
 cyclability and/or high temp. safety)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses
 7791-03-9, Lithium perchlorate 12031-65-1, Lithium nickel
 oxide (LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄)
 12190-79-3, Cobalt lithium oxide (CoLiO₂) 14283-07-9, Lithium
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium
 triflate 56525-42-9, Methyl propyl carbonate 90076-65-6
 135573-53-4, Cobalt lithium nickel oxide co0-11ini0-1o2
 RL: DEV (Device component use); USES (Uses)
 (nonaq. lithium secondary **battery** with improved
 cyclability and/or high temp. safety)

IT 96-54-8, n-Methylpyrrole 109-97-7, Pyrrole
 109-97-7D, Pyrrole, deriv. 625-82-1, 2,4-Dimethylpyrrole
 625-84-3, 2,5-Dimethylpyrrole 932-16-1, 2-Acetyl
 n-methylpyrrole 1072-83-9, 2-Acetylpyrrole 7553-56-2,
 Iodine, uses 7726-95-6, Bromine, uses 7782-50-5, Chlorine, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. lithium secondary **battery** with improved
 cyclability and/or high temp. safety)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L117 ANSWER 4 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 2005:78059 HCAPLUS
 DOCUMENT NUMBER: 142:159580
 TITLE: Long life lithium **batteries** with
 stabilized electrodes
 INVENTOR(S): Amine, Khalil; Kim, Jaekook; Vissers, Donald R.
 PATENT ASSIGNEE(S): USA
 SOURCE: U.S. Pat. Appl. Publ., 13 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005019670	A1	20050127	US 2004-857365	20040528
US 2006147809	A1	20060706	US 2006-338902	20060124
PRIORITY APPLN. INFO.:				20030717
				20040528
				200501

26

AB The present invention relates to nonaq. **electrolytes** having stabilization additives and electrochem. devices contg. the same. Thus the present invention provides **electrolytes** contg. an alkali metal salt, a polar aprotic solvent, a first additive that is a substituted or unsubstituted organoamine, substituted or unsubstituted alkane, substituted or unsubstituted alkene, or substituted or unsubstituted aryl compd., and/or a second additive that is a metal(chelato)borate. When used in electrochem. devices with, e.g., lithium manganese oxide spinel electrodes, the new **electrolytes** provide **batteries** with improved calendar and cycle life.

IT 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 15365-14-7, Iron lithium phosphate felipo4 33454-82-9, Lithium triflate 90076-65-6 132843-44-8

RL: DEV (Device component use); USES (Uses)
(long life **lithium batteries** with stabilized electrodes)

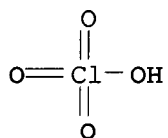
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS

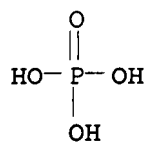
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 15365-14-7 HCAPLUS

CN Phosphoric acid, iron(2+) lithium salt (1:1:1) (9CI) (CA INDEX NAME)

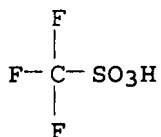


● Fe(II)

● Li

RN 33454-82-9 HCAPLUS

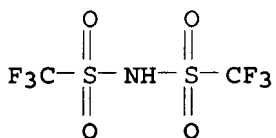
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

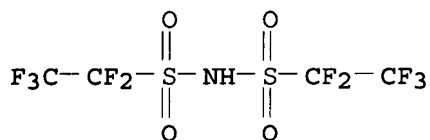
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

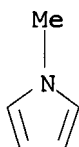
RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

IT 96-54-8, n-Methylpyrrole
 RL: MOA (Modifier or additive use); USES (Uses)
 (long life lithium **batteries** with stabilized
 electrodes)
 RN 96-54-8 HCAPLUS
 CN 1H-Pyrrole, 1-methyl- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-58; H01M004-52; H01M004-60; H01M004-50
 INCL 429326000; 429213000; 429224000; 429231100; 429223000; 429231300;
 429221000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium **battery** stabilized electrode
 IT Secondary **batteries**
 (lithium; long life lithium **batteries** with stabilized
 electrodes)
 IT **Battery** electrodes
Battery electrolytes
 (long life lithium **batteries** with stabilized
 electrodes)
 IT Intermetallic compounds
 RL: DEV (Device component use); USES (Uses)
 (long life lithium **batteries** with stabilized
 electrodes)
 IT Alkanes, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (long life lithium **batteries** with stabilized
 electrodes)
 IT Alkenes, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (long life lithium **batteries** with stabilized
 electrodes)
 IT Aromatic compounds
 RL: MOA (Modifier or additive use); USES (Uses)
 (long life lithium **batteries** with stabilized
 electrodes)
 IT Chelates
 RL: MOA (Modifier or additive use); USES (Uses)
 (long life lithium **batteries** with stabilized
 electrodes)

- IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
(org.; long life lithium **batteries** with stabilized electrodes)
- IT Tin alloy, base
RL: DEV (Device component use); USES (Uses)
(long life lithium **batteries** with stabilized electrodes)
- IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
115-10-6, Dimethyl ether 616-38-6, Dimethyl carbonate 623-53-0,
Ethyl methyl carbonate **7439-93-2**, Lithium, uses
7440-44-0, Carbon, uses 7664-38-2D, Phosphoric acid, alkyl fluoro
compd., **lithium salt** 7782-42-5, Graphite, uses
7791-03-9, Lithium perchlorate 11099-11-9, Vanadium oxide
12022-46-7, Iron lithium oxide (FeLiO₂) 12031-65-1, Lithium nickel
oxide (LiNiO₂) 12031-95-7, Lithium titanium oxide (Li₄Ti₅O₁₂)
12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12190-79-3, Cobalt
lithium oxide (CoLiO₂) 14283-07-9, Lithium tetrafluoroborate
15365-14-7, Iron lithium phosphate felipo₄ 21324-40-3,
Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate **90076-65-6**
128975-24-6, Lithium manganese nickel oxide limn_{0.5}ni_{0.5}o₂
132404-42-3 **132843-44-8** 609349-41-9, Cobalt lithium
manganese nickel oxide (Co_{0.3}LiMn_{0.3}Ni_{0.3}O₂)
RL: DEV (Device component use); USES (Uses)
(long life **lithium batteries** with stabilized electrodes)
- IT 84-15-1, o-Terphenyl 91-19-0, Quinoxaline 91-20-3, Naphthalene,
uses 91-22-5, Quinoline, uses 92-52-4, Biphenyl, uses
96-54-8, n-Methylpyrrole 100-43-6, 4-Vinylpyridine
100-69-6, 2-Vinylpyridine 101-84-8, Diphenyl ether 102-71-6,
Triethanolamine, uses 103-29-7, 1,2-Diphenylethane 106-99-0,
Butadiene, uses 110-86-1, Pyridine, uses 110-89-4, Piperidine,
uses 119-65-3, Isoquinoline 120-72-9, Indole, uses 288-32-4,
Imidazole, uses 289-80-5, Pyridazine 289-95-2, Pyrimidine
290-37-9, Pyrazine 1118-58-7, 1,3-Dimethyl 1,3-butadiene
1337-81-1, Vinyl Pyridine 4177-16-6, Pyrazine, vinyl- 4427-96-7,
Vinyl ethylene carbonate 7570-02-7, Divinyl carbonate
29383-23-1, Vinyl Imidazole 30676-86-9, Piperidine, vinyl-
30851-79-7 31094-36-7 51222-11-8 66281-01-4 66281-16-1
77208-21-0 244761-29-3, Lithium bis(oxalato)borate 409071-16-5
RL: MOA (Modifier or additive use); USES (Uses)
(long life lithium **batteries** with stabilized electrodes)

L117 ANSWER 5 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:633118 HCAPLUS
DOCUMENT NUMBER: 141:126408
TITLE: Lithium based **electrochemical**
cell systems with suppression of gas
evolution
INVENTOR(S): Hyung, Yoo-Eup; Vissers, Donald R.; Amine,
Khalil
PATENT ASSIGNEE(S): The University of Chicago, USA
SOURCE: U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004151951	A1	20040805	US 2003-738400	20031217

PRIORITY APPLN. INFO.: <-- US 2002-434214P P 20021217 <--

OTHER SOURCE(S): MARPAT 141:126408

AB Primary and secondary Li-ion and lithium-metal based **electrochem. cell** systems are disclosed. Suppression of gas generation is achieved in the cell through the addn. of an additive or additives to the **electrolyte** system of the resp. cell, or to the cell whether it be a liq., a solid- or plasticized polymer **electrolyte** system. The gas suppression additives are preferably based on unsatd. hydrocarbons.

IT 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 12676-27-6D, derivs. 15365-14-7, Iron lithium phosphate felipo4 33454-82-9, Lithium triflate 90076-65-6 132843-44-8 304646-82-0D, Phosphorofluoridic acid, monolithium salt, alkyl deriv.

RL: DEV (Device component use); USES (Uses)
(lithium based **electrochem. cell** systems with suppression of gas evolution)

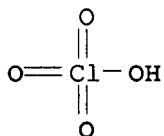
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

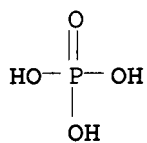
RN 12676-27-6 HCAPLUS

CN Boric acid, lithium salt (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 15365-14-7 HCAPLUS

CN Phosphoric acid, iron(2+) lithium salt (1:1:1) (9CI) (CA INDEX NAME)

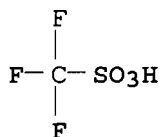


● Fe(II)

● Li

RN 33454-82-9 HCAPLUS

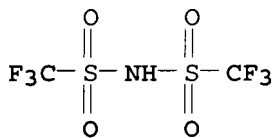
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

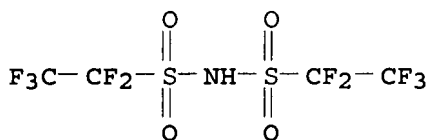
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

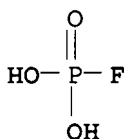
RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



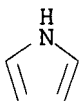
● Li

RN 304646-82-0 HCAPLUS
 CN Phosphorofluoridic acid, monolithium salt (9CI) (CA INDEX NAME)

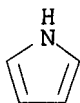


● Li

IT 109-97-7, Pyrrole 29992-75-4, 1H-Pyrrole, ethenyl-
 RL: MOA (Modifier or additive use); USES (Uses)
 (lithium based **electrochem. cell** systems with
 suppression of gas evolution)
 RN 109-97-7 HCAPLUS
 CN 1H-Pyrrole (9CI) (CA INDEX NAME)



RN 29992-75-4 HCAPLUS
 CN 1H-Pyrrole, ethenyl- (9CI) (CA INDEX NAME)

D1-CH=CH₂

IC ICM H01M016-00
 ICS H01M004-50; H01M004-58; H01M004-52; H01M010-40; H01M010-34;
 H01M010-52; H01M004-48
 INCL 429009000; 429231400; 429231950; 429149000; 429326000; 429331000;
 429332000; 429231100; 429231300; 429224000

MEI HUANG EIC1700 REM4B28 571-272-3952

08/31/2006

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **battery** gas generation suppression
IT Primary **batteries**
Secondary **batteries**
(lithium; lithium based **electrochem. cell**
systems with suppression of gas evolution)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate
623-53-0, Ethyl methyl carbonate 7439-93-2, Lithium, uses
7440-44-0, Carbon, uses 7791-03-9, Lithium perchlorate
11099-11-9, Vanadium oxide 12022-46-7, Iron lithium oxide felio2
12031-65-1, Lithium nickel oxide linio2 12031-72-0, Lithium
magnesium manganese oxide limg0.5mn1.5o4 12057-17-9, Lithium
manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2
12676-27-6D, derivs. 14283-07-9, Lithium tetrafluoroborate
15365-14-7, Iron lithium phosphate felipo4 21324-40-3,
Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate 90076-65-6
128975-24-6, Lithium manganese nickel oxide limn0.5ni0.5o2
132404-42-3 132843-44-8 177997-11-4, Cobalt gallium
lithium nickel oxide 177997-12-5, Boron Cobalt lithium nickel
oxide 177997-13-6, Aluminum cobalt lithium nickel oxide
244304-18-5, Cobalt lithium nickel silicon oxide 244304-20-9,
Cobalt lithium nickel titanium oxide 304646-82-0D,
Phosphorofluoridic acid, monolithium salt, alkyl deriv.
609349-41-9, Cobalt Lithium manganese nickel oxide
Co0.3limn0.3ni0.3o2
RL: DEV (Device component use); USES (Uses)
(lithium based **electrochem. cell**
systems with suppression of gas evolution)
IT 100-42-5, Styrene, uses 106-99-0, 1,3-Butadiene, uses
109-97-7, Pyrrole 110-85-0, Piperazine, uses 115-86-6,
Triphenylphosphate 463-79-6D, Carbonic acid, arom. ester
513-81-5, 2,3-Dimethyl-1,3-butadiene 592-42-7, 1,5-Hexadiene
758-86-1, 2,3-Dimethyl-1,4-pentadiene 1337-81-1, Vinylpyridine
4427-96-7, Vinyl ethylene carbonate 16761-08-3 29992-75-4
, 1H-Pyrrole, ethenyl- 71437-41-7, Piperazine, ethenyl-
RL: MOA (Modifier or additive use); USES (Uses)
(lithium based **electrochem. cell** systems with
suppression of gas evolution)

L117 ANSWER 6 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:219899 HCAPLUS

DOCUMENT NUMBER: 140:238519

TITLE: Overcharge protection of nonaqueous rechargeable
lithium **batteries** by cyano-substituted
thiophenes as **electrolyte** additives

INVENTOR(S): Otterstedt, Ralph; Kirchmeyer, Stephan; Brassat,
Lutz

PATENT ASSIGNEE(S): Germany

SOURCE: U.S. Pat. Appl. Publ., 10 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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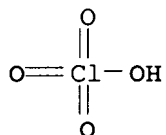
US 2004053138	A1	20040318	US 2003-660846	200309 12
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DE 10340500	A1	20040325	DE 2003-10340500	200309 03
			<--	
JP 2004111393	A2	20040408	JP 2003-323107	200309 16
			<--	
CN 1490892	A	20040421	CN 2003-158890	200309 16
			<--	
PRIORITY APPLN. INFO.:			DE 2002-10244589	A 200209 16
			<--	

OTHER SOURCE(S): MARPAT 140:238519

AB The invention relates to the use of cyano-substituted thiophenes as **electrolyte** additives for protecting nonaq., rechargeable lithium **batteries** from overcharging, and lithium **batteries** comprising these additives. The **electrolyte** contains the thiophene additive at 2-5 vol.%.
 IT 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate
 RL: DEV (Device component use); USES (Uses)
 (overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 110-02-1D, Thiophene, cyano-substituted
 RL: MOA (Modifier or additive use); USES (Uses)
 (overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
 RN 110-02-1 HCAPLUS

CN Thiophene (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-52; H01M004-58; H01M004-40
INCL 429307000; 429327000; 429231400; 429231800; 429231950; 429223000;
429231100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **battery** overcharge protection cyano substituted
thiophene **electrolyte** additive
IT Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(alkanesulfonic, perfluorinated. **lithium salts**
; overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(arenesulfonic, perfluorinated. **lithium salts**
; overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT Imides
RL: DEV (Device component use); USES (Uses)
(bisfluoroalkylsulfonyl, **lithium salt**;
overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT Perfluoro compounds
RL: DEV (Device component use); USES (Uses)
(carboxylic acids, **lithium salts**; overcharge
protection of nonaq. rechargeable lithium **batteries** by
cyano-substituted thiophenes as **electrolyte** additives)
IT Carboxylic acids, uses
RL: DEV (Device component use); USES (Uses)
(esters; overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT Secondary **batteries**
(lithium; overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT Polymers, uses
RL: DEV (Device component use); USES (Uses)
(membrane; overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT Carboxylic acids, uses
RL: DEV (Device component use); USES (Uses)
(nitriles; overcharge protection of nonaq. rechargeable lithium
batteries by cyano-substituted thiophenes as
electrolyte additives)
IT **Battery electrolytes**
Secondary **battery** separators
(overcharge protection of nonaq. rechargeable lithium

- batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT Alkanes, uses
Carbonaceous materials (technological products)
Ethers, uses
Lactones
Oxides (inorganic), uses
Transition metal chalcogenides
Transition metal oxides
RL: DEV (Device component use); USES (Uses)
(overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT Alkanes, uses
RL: DEV (Device component use); USES (Uses)
(perfluorinated; overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT Carboxylic acids, uses
RL: DEV (Device component use); USES (Uses)
(perfluoro, **lithium salts**; overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(porous; overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 463-79-6D, Carbonic acid, ester
616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
872-36-6, Vinylene carbonate 7439-93-2, Lithium, uses
7791-03-9, Lithium perchlorate 12057-24-8, Lithium oxide, uses
14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
29935-35-1, Lithium hexafluoroarsenate
113066-89-0, Cobalt lithium nickel oxide Co_{0.2}LiNi_{0.8}O₂
131344-56-4, Cobalt lithium nickel oxide 177997-13-6, Aluminum
Cobalt lithium nickel oxide 182442-95-1, Cobalt lithium manganese
nickel oxide 244761-29-3, Lithium bisoxalatoborate
RL: DEV (Device component use); USES (Uses)
(overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)
- IT 110-02-1D, Thiophene, cyano-substituted
RL: MOA (Modifier or additive use); USES (Uses)
(overcharge protection of nonaq. rechargeable lithium **batteries** by cyano-substituted thiophenes as **electrolyte** additives)

L117 ANSWER 7 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:163800 HCAPLUS
DOCUMENT NUMBER: 136:219519
TITLE: Phenyl boron-based compounds as anion receptors
for nonaqueous **battery**
electrolytes

INVENTOR(S): Lee, Hung Sui; Yang, Xiao-qing; McBreen, James;
 Sun, Xuehui
 PATENT ASSIGNEE(S): Brookhaven Science Associates, Llc, USA
 SOURCE: U.S., 15 pp., Cont.-in-part of U. S. 6,022,643.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6352798	B1	20020305	US 2000-492569	20000127
US 6022643	A	20000208	US 1997-986846	19971208
			US 1997-986846	19971208

PRIORITY APPLN. INFO.: US 1997-986846 A2 19971208

OTHER SOURCE(S): MARPAT 136:219519

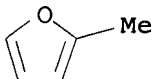
AB Novel fluorinated boronate-based compds. which act as anion receptors in nonaq. **battery electrolytes** are provided. When added to nonaq. **battery electrolytes**, the fluorinated boronate-based compds. of the invention enhance ionic cond. and cation transference no. of nonaq. **electrolytes**. The fluorinated boronate-based anion receptors include different fluorinated alkyl and aryl groups.

IT 534-22-5, 2-Methylfuran 2923-17-3, Lithium trifluoroacetate 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 87187-79-9, Propanoic acid, pentafluoro-, lithium salt 87442-01-1, Benzoic acid, pentafluoro-, lithium salt

RL: DEV (Device component use); USES (Uses)
 (Ph boron-based compds. as anion receptors for nonaq. **battery electrolytes**)

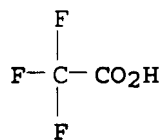
RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



RN 2923-17-3 HCAPLUS

CN Acetic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)

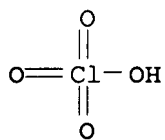


● Li

RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

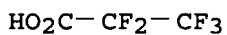
Li

RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



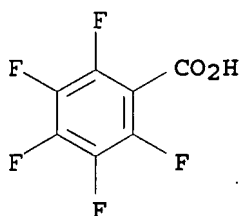
● Li

RN 87187-79-9 HCAPLUS
CN Propanoic acid, pentafluoro-, lithium salt (9CI) (CA INDEX NAME)



● Li

RN 87442-01-1 HCAPLUS
CN Benzoic acid, pentafluoro-, lithium salt (9CI) (CA INDEX NAME)



● Li

IC ICM H01M006-14
 INCL 429324000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 27
 ST **battery electrolyte** anion receptor fluorinated boronate based compd
 IT **Battery electrolytes**
 Ionic conductivity
 (Ph boron-based compds. as anion receptors for nonaq. **battery electrolytes**)
 IT Polyanilines
 Polyoxyalkylenes, uses
 Polysulfides
 Transition metal chalcogenides
 Transition metal oxides
 RL: DEV (Device component use); USES (Uses)
 (Ph boron-based compds. as anion receptors for nonaq. **battery electrolytes**)
 IT Oxides (inorganic), uses
 RL: DEV (Device component use); USES (Uses)
 (lithiated; Ph boron-based compds. as anion receptors for nonaq. **battery electrolytes**)
 IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (Ph boron-based compds. as anion receptors for nonaq. **battery electrolytes**)
 IT 75-05-8, Acetonitrile, uses 96-48-0, γ -Butyrolactone
 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7,
 Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9, Thf,
 uses 110-71-4, 1,2-Dimethoxyethane 115-10-6, Dimethyl ether
 126-33-0, Sulfolane 534-22-5, 2-Methylfuran 616-38-6,
 Dimethyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4,
 1-Methyl-2-pyrrolidinone, uses 1072-47-5 1072-71-5,
 2,5-Dimercapto-1,3,4-thiadiazole 2923-17-3, Lithium
 trifluoroacetate 7439-93-2, Lithium, uses 7440-44-0D,
 Carbon, intercalation compd., with lithium 7447-41-8, Lithium
 chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium
 fluoride, uses 7791-03-9, Lithium perchlorate 9011-17-0,
 Hexafluoropropylene-vinylidene fluoride copolymer 10377-51-2,
 Lithium iodide 12031-65-1, Lithium nickel oxide linio2
 12057-17-9, Lithium manganese oxide limn2o4 12162-79-7, Lithium
 manganese oxide limno2 12190-79-3, Cobalt lithium oxide colio2
 12201-18-2, Lithium molybdenum sulfide limos2 14283-07-9, Lithium
 tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate
 19836-78-3, 3-Methyl-2-oxazolidinone 21324-40-3, Lithium

hexafluorophosphate 25014-41-9, Polyacrylonitrile 25233-30-1,
 Polyaniline 25322-68-3, Peo 25948-29-2, Carbon disulfide,
 homopolymer 29935-35-1, Lithium hexafluoroarsenate 39448-96-9,
 Graphite lithium 55326-82-4, Lithium titanium sulfide litis2
 55886-04-9, Lithium niobium selenide Li3NbSe3 87187-79-9,
 Propanoic acid, pentafluoro-, lithium salt
 87442-01-1, Benzoic acid, pentafluoro-, lithium
 salt 131344-56-4, Cobalt lithium nickel oxide
 138187-48-1, Lithium vanadium oxide Li1.2V2O5 152991-98-5,
 Aluminum lithium nickel oxide 159967-11-0, Lithium magnesium
 nickel oxide 180984-62-7, Lithium nickel titanium oxide
 256345-13-8, Lithium vanadium oxide Li2.5V6O13
 RL: DEV (Device component use); USES (Uses)

(Ph boron-based compds. as anion receptors for nonaq.

battery electrolytes)

IT 23542-71-4P 365458-32-8P 365458-33-9P 365458-34-0P
 365458-35-1P 365458-36-2P 365458-37-3P 365458-38-4P
 365458-39-5P 365458-40-8P 402564-35-6P 402564-36-7P
 402564-37-8P 402564-38-9P 402564-39-0P

RL: DEV (Device component use); MOA (Modifier or additive use); SPN
 (Synthetic preparation); PREP (Preparation); USES (Uses)

(Ph boron-based compds. as anion receptors for nonaq.

battery electrolytes)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L117 ANSWER 8 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:103441 HCAPLUS

DOCUMENT NUMBER: 136:153869

TITLE: Lithium-sulfur **batteries** with high
 capacity and good rate capability

INVENTOR(S): Jung, Yongju; Kim, Seok; Choi, Yunsuk; Choi, Soo
 Seok; Lee, Jeawoan; Hwang, Duck Chul; Kim, Joo
 Soak

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1178555	A2	20020206	EP 2001-117788	20010802

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R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, SI, LT, LV, FI, RO	
KR 2002011562	A 20020209 KR 2000-44900
	20000802

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KR 2002011563	A 20020209 KR 2000-44901	20000802
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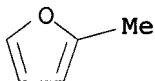
JP 2002075446 A2 20020315 JP 2001-213286 20010713
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 US 2002045102 A1 20020418 US 2001-918463 20010801
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 CN 1336696 A 20020220 CN 2001-132527 20010802
 <--
 PRIORITY APPLN. INFO.: KR 2000-44900 A 20000802
 <--
 KR 2000-44901 A 20000802
 <--

AB A lithium-sulfur **battery** includes a neg. electrode, a pos. electrode, and an **electrolyte**. The neg. electrode includes a neg. active material selected from materials in which lithium intercalation reversibly occur, lithium alloy or lithium metal. The pos. electrode includes at least one of elemental sulfur and organosulfur compds. for a pos. active material, and an elec. conductive material. The **electrolyte** includes at least two groups selected from a weak polar solvent group, a strong polar solvent group and a lithium protection solvent group, where the **electrolyte** includes at least one or more solvents selected from the same group. The **electrolyte** may optionally include one or more **electrolyte** salts.

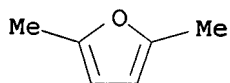
IT 110-00-9, Furan 534-22-5, 2-Methylfuran 625-86-5, 2,5-Dimethylfuran 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (lithium-sulfur **batteries** with high capacity and good rate capability)
 RN 110-00-9 HCAPLUS
 CN Furan (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 534-22-5 HCAPLUS
 CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



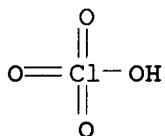
RN 625-86-5 HCAPLUS
 CN Furan, 2,5-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

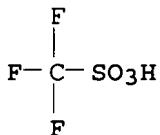
Li

RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



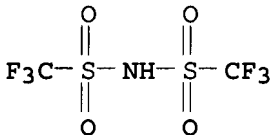
● Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

IC ICM H01M010-40
ICS H01M010-36

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium sulfur **battery** good rate capability

IT **Battery electrolytes**
(lithium-sulfur **batteries** with high capacity and good rate capability)

IT Group IIIA elements
Group IVA elements
Sulfides, uses
Transition metals, uses
RL: MOA (Modifier or additive use); USES (Uses)
(lithium-sulfur **batteries** with high capacity and good rate capability)

IT Quaternary ammonium compounds, uses
RL: DEV (Device component use); USES (Uses)
(tetraalkyl; lithium-sulfur **batteries** with high capacity and good rate capability)

IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(lithium-sulfur **batteries** with high capacity and good rate capability)

IT 60-29-7, Diethyl ether, uses 67-68-5, DmsO, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 75-21-8, Ethylene oxide, uses 77-78-1, Dimethyl sulfate 96-47-9, 2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone 105-58-8, Diethyl carbonate 108-88-3, Toluene, uses 109-99-9, Thf, uses 110-00-9, Furan 110-71-4 111-55-7, Ethylene glycol diacetate 115-10-6, Dimethyl ether 123-91-1, 1,4-Dioxane, uses 126-33-0, Sulfolane 127-19-5, Dimethyl acetamide 300-87-8, 3,5-Dimethylisoxazole 534-22-5, 2-Methylfuran 616-38-6, Dimethyl carbonate 616-42-2, Dimethyl sulfite 625-86-5, 2,5-Dimethylfuran 646-06-0, Dioxolane 680-31-9, Hexamethyl phosphoric triamide, uses 872-50-4, n-Methylpyrrolidone, uses 1072-47-5, 1,3-Dioxolane, 4-methyl 1330-20-7, Xylene, uses 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, org. compd. 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 19836-78-3 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium triflate 90076-65-6 147545-69-5, Ethylene glycol sulfite
RL: DEV (Device component use); USES (Uses)
(lithium-sulfur **batteries** with high capacity and good rate capability)

IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-96-5, Manganese, uses 7439-97-6, Mercury, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-26-8, Technetium, uses 7440-28-0, Thallium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-43-9, Cadmium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-74-6, Indium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(lithium-sulfur **batteries** with high capacity and good rate capability)

rate capability)
 IT 74432-42-1, Lithium polysulfide
 RL: TEM (Technical or engineered material use); USES (Uses)
 (lithium-sulfur **batteries** with high capacity and good
 rate capability)

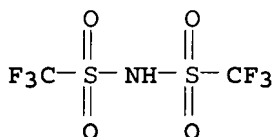
L117 ANSWER 9 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 2001:449916 HCAPLUS
 DOCUMENT NUMBER: 135:45792
 TITLE: Methods of purifying organic **lithium salts**
 INVENTOR(S): Gorkovenko, Alexander; Soloveichik, Grigorii L.
 PATENT ASSIGNEE(S): Moltech Corporation, USA
 SOURCE: U.S., 16 pp., Cont.-in-part of U.S. Ser. No.
 127,468, abandoned.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6248883	B1	20010619	US 1998-205873	19981204
WO 2000006538	A1	20000210	WO 1999-US17347	19990729
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 9953293	A1	20000221	AU 1999-53293	19990729
PRIORITY APPLN. INFO.:				
			US 1998-127468	B2 19980731
			US 1998-205873	A 19981204
			WO 1999-US17347	W 19990729

AB Provided are methods of purifn. of an org. **lithium salt** comprising the steps of: (a) dissolving an impure org. **lithium salt** in a soln. comprising an org.

complexing solvent; (b) crystg. from said soln. a solid solvate complex comprising said **lithium salt** and said org. complexing solvent; (c) sepg. said solid solvate complex from said soln.; (d) dissocg. said solid solvate complex to yield: (i) said **lithium salt** in a solid form, and, (ii) a volatile compn. comprising said org. complexing solvent; and, (e) removing said volatile compn. to yield said **lithium salt** in a solid form of purity greater than the purity of said impure **lithium salt**. The present invention also pertains to **electrolytes** for elec. current producing cells comprising such purified **lithium salts**. Thus, (CF₃SO₂)₂NLi was purified by crystn. of the 1,4-dioxane complex and heating under vacuum at 125° to remove the dioxane.

IT 90076-65-6P, Lithium bis(trifluoromethylsulfonyl)imide
 RL: DEV (Device component use); PUR (Purification or recovery); PREP (Preparation); USES (Uses)
 (purifn. by crystn. of ether complex for use as **battery electrolyte**)
 RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

IT 110-00-9, Furan
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (purifn. of org. **lithium salts** by ether complexation, crystn. and removal)
 RN 110-00-9 HCAPLUS
 CN Furan (7CI, 8CI, 9CI) (CA INDEX NAME)



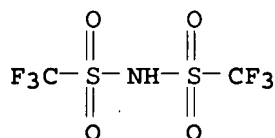
IT 7439-93-2DP, Lithium, salts, preparation
 RL: PUR (Purification or recovery); PREP (Preparation)
 (purifn. of org. **lithium salts** by ether complexation, crystn. and removal)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 344563-88-8P 344563-90-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(purifn. of org. **lithium salts** by ether
complexation, crystn. and removal)
RN 344563-88-8 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
lithium salt, compd. with 1,4-dioxane (2:3) (9CI) (CA INDEX NAME)

CM 1

CRN 90076-65-6
CMF C2 H F6 N O4 S2 . Li



● Li

CM 2

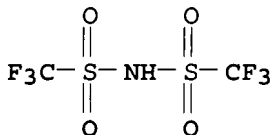
CRN 123-91-1
CMF C4 H8 O2



RN 344563-90-2 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
lithium salt, compd. with 1,4-dioxane (1:2) (9CI) (CA INDEX NAME)

CM 1

CRN 90076-65-6
CMF C2 H F6 N O4 S2 . Li



● Li

CM 2

CRN 123-91-1

CMF C4 H8 O2



IC ICM C07D281-02
ICS C07D207-36
INCL 540544000
CC 21-2 (General Organic Chemistry)
Section cross-reference(s): 52
ST org **lithium salt** purifn ether complexation;
electrolyte lithium salt purifn
IT Ethers, reactions
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(complexation of ethers with lithium for purifn. of org. **lithium salts**)
IT Phenols, preparation
Sulfonamides
RL: PUR (Purification or recovery); PREP (Preparation)
(**lithium salts**)
IT Carboxylic acids, preparation
Sulfonic acids, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(**lithium salts**; purifn. of org. **lithium salts** by ether complexation, crystn. and removal)
IT **Battery electrolytes**
(purifn. of lithium bis(trifluoromethanesulfonyl)imide for use as **battery electrolyte**)
IT **90076-65-6P**, Lithium bis(trifluoromethylsulfonyl)imide
RL: DEV (Device component use); PUR (Purification or recovery); PREP (Preparation); USES (Uses)
(purifn. by crystn. of ether complex for use as **battery electrolyte**)
IT 60-29-7, Diethyl ether, reactions 108-20-3, Diisopropyl ether
109-99-9, Tetrahydrofuran, reactions 110-00-9, Furan
110-87-2, Dihydropyran 111-43-3, Dipropyl ether 115-10-6,
Dimethyl ether 123-91-1, 1,4-Dioxane, reactions 142-68-7,
Tetrahydropyran 142-96-1, Dibutyl ether 505-68-0, 1,4-Dioxepane
540-67-0, Ethyl methyl ether 557-17-5, Methyl propyl ether
592-90-5, Oxepane 598-53-8, Methyl isopropyl ether 628-28-4,
Methyl butyl ether 929-56-6, Methyl octyl ether 1634-04-4,
Methyl tert-butyl ether 4747-07-3, Methyl hexyl ether 6572-91-4,
1,4-Dioxocane 6572-98-1, Oxocane 10143-60-9, Di(2-ethylhexyl)
ether 13423-15-9, 3-Methyltetrahydrofuran
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(purifn. of org. **lithium salts** by ether complexation, crystn. and removal)
IT **7439-93-2DP**, **Lithium, salts**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)

(purifn. of org. **lithium salts** by ether complexation, crystn. and removal)

IT 344563-88-8P 344563-90-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(purifn. of org. **lithium salts** by ether complexation, crystn. and removal)

IT 78-78-4, Isopentane 95-47-6, o-Xylene, uses 96-37-7,
Methylcyclopentane 98-82-8, Isopropylbenzene 106-42-3, p-Xylene,
uses 107-83-5, Isohexane 108-38-3, m-Xylene, uses 108-67-8,
Mesitylene, uses 108-87-2, Methylcyclohexane 108-88-3, Toluene,
uses 108-90-7, Chlorobenzene, uses 109-66-0, Pentane, uses
110-54-3, Hexane, uses 110-82-7, Cyclohexane, uses 111-65-9,
Octane, uses 111-84-2, Nonane 124-18-5, Decane 287-92-3,
Cyclopentane 291-64-5, Cycloheptane 292-64-8, Cyclooctane
540-84-1, Isooctane 25321-09-9, Diisopropylbenzene 25321-22-6,
Dichlorobenzene 25340-17-4, Diethylbenzene 25550-14-5,
Methylethylbenzene
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for purifn. of org. **lithium salts** by
ether complexation, crystn. and removal)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

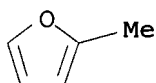
L117 ANSWER 10 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:95943 HCAPLUS
DOCUMENT NUMBER: 132:125353
TITLE: Boron compounds as anion binding agents for
nonaqueous **battery electrolytes**
INVENTOR(S): Lee, Hung Sui; Yang, Xia-ong; McBreen, James;
Xiang, Caili
PATENT ASSIGNEE(S): Brookhaven Science Associates, USA
SOURCE: U.S., 11 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6022643	A	20000208	US 1997-986846	19971208
US 6352798	B1	20020305	US 2000-492569	20000127
PRIORITY APPLN. INFO.:			US 1997-986846	A2 19971208

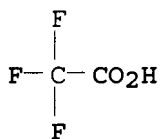
AB Novel fluorinated boron-based compds. which act as anion receptors
in nonaq. **battery electrolytes** are provided.
The anion receptor is a compd. of formula Q3B, where Q is a
F-bearing moiety selected from the group of (CF3)2CHO,

(CF₃)₂C(C₆H₅)O, (CF₃)₃CO, FC₆H₄O, F₂C₆H₃O, F₄C₆H₃O, C₆F₅O, CF₃C₆H₄O, and (CF₃)₂C₆H₃O. When added to nonaq. **battery electrolytes**, the fluorinated boron-based compds. of the invention enhance ionic cond. and cation transference no. of nonaq. **electrolytes**. The fluorinated boron-based anion receptors include borane and borate compds. bearing different fluorinated alkyl and aryl groups.

IT 534-22-5, 2-Methylfuran 2923-17-3, Lithium trifluoroacetate 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compd. with carbon, uses 7791-03-9 87187-79-9 87442-01-1, Benzoic acid, pentafluoro-, **lithium salt**
 RL: DEV (Device component use); USES (Uses)
 (boron compds. as anion binding agents for nonaq. **battery electrolytes**)
 RN 534-22-5 HCAPLUS
 CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



RN 2923-17-3 HCAPLUS
 CN Acetic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

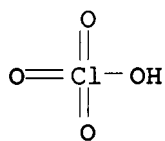
RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

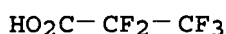
Li

RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



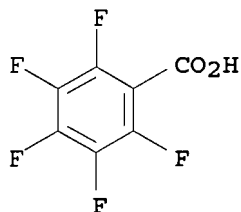
● Li

RN 87187-79-9 HCAPLUS
 CN Propanoic acid, pentafluoro-, lithium salt (9CI) (CA INDEX NAME)



● Li

RN 87442-01-1 HCAPLUS
 CN Benzoic acid, pentafluoro-, lithium salt (9CI) (CA INDEX NAME)



● Li

IC ICM H01M006-14
 INCL 429324000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery electrolyte** fluorinated boron based
 anion receptor
 IT **Battery electrolytes**
 Ionic conductivity
 (boron compds. as anion binding agents for nonaq. **battery electrolytes**)
 IT Intercalation compounds
 Polyanilines
 Polyoxyalkylenes, uses
 Transition metal chalcogenides
 Transition metal oxides
 RL: DEV (Device component use); USES (Uses)
 (boron compds. as anion binding agents for nonaq. **battery electrolytes**)
 IT Oxides (inorganic), uses
 RL: DEV (Device component use); USES (Uses)

(intercalation compd. with lithium; boron compds. as anion binding agents for nonaq. **battery electrolytes**)

IT Secondary **batteries**

(lithium; boron compds. as anion binding agents for nonaq. **battery electrolytes**)

IT Polysulfides

RL: DEV (Device component use); USES (Uses)

(org.; boron compds. as anion binding agents for nonaq. **battery electrolytes**)

IT Lithium alloy

RL: DEV (Device component use); USES (Uses)

(boron compds. as anion binding agents for nonaq. **battery electrolytes**)

IT 75-05-8, Acetonitrile, uses 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9, uses 110-71-4, 1,2-Dimethoxyethane 115-10-6, Dimethyl ether 126-33-0, Sulfolane 534-22-5, 2-Methylfuran 616-38-6, Dimethyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4, uses 1072-47-5, 1,3-Dioxolane, 4-Methyl 1072-71-5, 2,5-Dimercapto-1,3,4-thiadiazole 2923-17-3, Lithium trifluoroacetate 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compd. with carbon, uses 7440-44-0D, Carbon, intercalation compd. with lithium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 7791-03-9 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 10377-51-2, Lithium iodide 12031-65-1, Lithium nickel oxide LiNiO_2 12057-17-9, Lithium manganese oxide LiMn_2O_4 12162-79-7, Lithium manganese oxide LiMnO_2 12190-79-3, Cobalt lithium oxide CoLiO_2 12201-18-2, Lithium molybdenum sulfide LiMoS_2 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 19836-78-3, 3-Methyl-2-oxazolidinone 21324-40-3, Lithium hexafluorophosphate 25014-41-9, Polyacrylonitrile 25233-30-1, Polyaniline 25322-68-3 25948-29-2, Carbon disulfide, homopolymer 29935-35-1, Lithium hexafluoroarsenate 39448-96-9, Graphite lithium 55326-82-4, Lithium titanium sulfide LiTiS_2 55886-04-9, Lithium niobium selenide Li_3NbSe_3 87187-79-9 87442-01-1, Benzoic acid, pentafluoro-, lithium salt 138187-48-1, Lithium vanadium oxide $\text{Li}_1.2\text{V}_2\text{O}_5$ 256345-13-8, Lithium vanadium oxide ($\text{Li}_{1.5}\text{V}_6\text{O}_{13}$)

RL: DEV (Device component use); USES (Uses)

(boron compds. as anion binding agents for nonaq. **battery electrolytes**)

IT 121-43-7 659-18-7 755-53-3 856-46-2 1095-03-0 1109-15-5 6919-80-8 32766-52-2 146355-12-6 210834-28-9 210834-35-8 210834-37-0 210834-40-5 210834-42-7

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(boron compds. as anion binding agents for nonaq. **battery electrolytes**)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L117 ANSWER 11 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:497044 HCAPLUS

DOCUMENT NUMBER: 131:104539

TITLE: Secondary **batteries** with hybrid

inorganic-organic electrodes formed from
conductive polymers and active inorganic
substances

INVENTOR(S): Gomez Romero, Pedro; Lira Cantu, Monica; Casan
Pastor, Nieves

PATENT ASSIGNEE(S): Consejo Superior de Investigaciones Cientificas,
Spain

SOURCE: Span., 11 pp.
CODEN: SPXXAD

DOCUMENT TYPE: Patent

LANGUAGE: Spanish

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

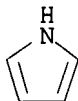
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
ES 2120324	A1	19981016	ES 1995-599	199503 27
ES 2120324	B1	19990701	ES 1995-599	199503 27

PRIORITY APPLN. INFO.: <--

AB The secondary **batteries** contain a lithium or lithium alloy anode, an **electrolyte**, and a hybrid cathode. The hybrid cathode consists of a conductive polymer doped with an inorg. substance having oxidn.-redn. capacity. The anode may also be a hybrid electrode. The **battery** can be used in elec. vehicles, household appliances, sensors and in the fields of catalysis and electrocatalysis. In an example, the **battery** comprised a Li anode, a polypropylene separator impregnated with a soln. of LiClO₄ in propylene carbonate, and a polypyrrole/H3PMo12O₄₀ cathode.

IT 109-97-7D, Pyrrole, polymers 7439-93-2, Lithium, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(secondary **batteries** with hybrid electrodes contg. conductive polymers and active inorg. substances)

RN 109-97-7 HCAPLUS
CN 1H-Pyrrole (9CI) (CA INDEX NAME)



RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

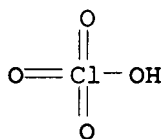
Li

IT 7791-03-9, Lithium perchlorate

RL: NUU (Other use, unclassified); USES (Uses)
 (secondary **batteries** with hybrid electrodes contg.
 conductive polymers and active inorg. substances)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IC ICM H01M004-36

ICS H01M004-60

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 47, 67

ST secondary **battery** hybrid polymer cathode; lithium
 secondary **battery** hybrid cathode; cathode hybrid org inorg
 secondary **battery**

IT Electric appliances

Electric vehicles

Sensors

(**batteries** for; secondary **batteries** with
 hybrid electrodes contg. conductive polymers and active inorg.
 substances)

IT Catalysis

(electrocatalysis, **batteries** for; secondary
batteries with hybrid electrodes contg. conductive
 polymers and active inorg. substances)

IT Secondary **batteries**

(lithium; secondary **batteries** with hybrid electrodes
 contg. conductive polymers and active inorg. substances)

IT **Battery** cathodes

Battery electrodes

Conducting polymers

Secondary **batteries**

(secondary **batteries** with hybrid electrodes contg.
 conductive polymers and active inorg. substances)

IT Cyanides (inorganic), uses

Heteropoly acids

Oxides (inorganic), uses

Polyanilines

Sulfides, uses

RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)

(secondary **batteries** with hybrid electrodes contg.
 conductive polymers and active inorg. substances)

IT Lithium alloy

RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)

(secondary **batteries** with hybrid electrodes contg.
 conductive polymers and active inorg. substances)

IT 62-53-3D, Aniline, polymers 106-50-3D, p-Phenylenediamine,
 polymers 109-97-7D, Pyrrole, polymers 275-51-4D,

Azulene, polymers 1313-13-9, Manganese oxide MnO₂, uses 1313-27-5, Molybdenum oxide MoO₃, uses 1314-35-8, Tungsten oxide WO₃, uses 1314-62-1, Vanadium oxide V₂O₅, uses 1317-33-5, Molybdenum sulfide MoS₂, uses 1317-38-0, Copper oxide CuO, uses 7439-93-2, Lithium, uses 12026-57-2, H₃PMo₁₂O₄₀ 12031-65-1, Lithium nickel oxide LiNiO₂ 12036-22-5, Tungsten oxide WO₂ 12037-42-2, Vanadium oxide V₆O₁₃ 12039-13-3, Titanium sulfide TiS₂ 12057-17-9, Lithium manganese oxide LiMn₂O₄ 12190-79-3, Lithium cobalt oxide LiCoO₂ 18868-43-4, Molybdenum oxide MoO₂ 25168-37-0, Poly(p-phenylenediamine) 25233-30-1, Polyaniline 30604-81-0, Polypyrrole 39448-96-9, Graphite, compd. with lithium 72785-69-4, Lithium alloy, Li,Al 82451-56-7, Polyazulene
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(secondary **batteries** with hybrid electrodes contg. conductive polymers and active inorg. substances)

IT 60-00-4, EDTA, uses 67-42-5, EGTA 75-05-8, Acetonitrile, uses 108-32-7, Propylene carbonate 139-13-9 482-54-2, Cyclohexanediaminetetraacetic acid 4408-81-5, PDTA 7601-90-3, Perchloric acid, uses 7664-93-9, Sulfuric acid, uses 7727-54-0, Ammonium persulfate 7791-03-9, Lithium perchlorate
 RL: NUU (Other use, unclassified); USES (Uses)

(secondary **batteries** with hybrid electrodes contg. conductive polymers and active inorg. substances)

L117 ANSWER 12 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1997:437343 HCAPLUS
 DOCUMENT NUMBER: 127:196790
 TITLE: Polymers and copolymers of pyrrole and thiophene as electrodes in lithium cells
 AUTHOR(S): Sanchez De Pinto, M. I.; Mishima, H. T.; Lopez De Mishima, B. A.
 CORPORATE SOURCE: Inst. Cs. Quimicas, F.A.A., Univ. Nacional Santiago de Estero, Santiago del Estero, 4200, Argent.
 SOURCE: Journal of Applied Electrochemistry (1997), 27(7), 831-838
 CODEN: JAELEBJ; ISSN: 0021-891X
 PUBLISHER: Chapman & Hall
 DOCUMENT TYPE: Journal
 LANGUAGE: English

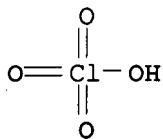
AB The performance of pyrrole and thiophene polymer electrodes in lithium cells was examd. in the lithium perchlorate-propylene carbonate **electrolyte** by cyclic voltammetry. Polypyrrole films were synthesized in 'wet' and 'dry' conditions; pyrrole and thiophene copolymers were prepd. at different potentials and bilayers were prepd. by sequential deposition of polythiophene (PTh) and polypyrrole (PPy) films. The polymers were cycled between 2.0 V and 4.0 V in the lithium cells. The effects of disconnecting the electrodes from the cell on the behavior of the polymers regarding doping and coulombic efficiency were also studied. The cycling performance of the 'wet' PPy is better than 'dry' PPy, bilayer PTh/PPy and copolymers. No mixed behavior was obsd. for a bilayer where the inner layer was polythiophene and the outer layer was polypyrrole with a thickness PPy/PTh ratio equal to ten. The copolymer prepd. at 3.9 V vs. Li/Li⁺ showed the higher energy capacity in W h kg⁻¹ calcd. from the anodic charge.

IT 7791-03-9, Lithium perchlorate
 RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)

(cyclic voltammetry of polypyrrole and polypyrrole-polythiophene bilayers and pyrrole-thiophene copolymers in lithium perchlorate-propylene carbonate electrolyte)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 110-02-1, Thiophene

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(electrochem. polymn. with and without pyrrole in lithium perchlorate-propylene carbonate electrolyte)

RN 110-02-1 HCAPLUS

CN Thiophene (8CI, 9CI) (CA INDEX NAME)

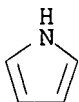


IT 109-97-7, Pyrrole

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(electrochem. polymn. with and without thiophene in lithium perchlorate-propylene carbonate electrolyte)

RN 109-97-7 HCAPLUS

CN 1H-Pyrrole (9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(polymers and copolymers of pyrrole and thiophene as electrodes in lithium cells)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 72-2 (Electrochemistry)

Section cross-reference(s): 35, 36, 52

IT Polymerization

(electrochem.; of pyrrole and thiophene and pyrrole with

- thiophene in lithium perchlorate-propylene carbonate
electrolyte)
- IT Cyclic voltammetry
 (of polypyrrole and polypyrrole-polythiophene bilayers and
 pyrrole-thiophene copolymers in lithium perchlorate-propylene
 carbonate **electrolyte**)
- IT **Battery** cathodes
 Battery electrodes
 (polypyrrole and polypyrrole-polythiophene bilayers and
 pyrrole-thiophene copolymers)
- IT 89298-12-4, Pyrrole-thiophene copolymer
 RL: DEV (Device component use); PRP (Properties); RCT (Reactant);
 RACT (Reactant or reagent); USES (Uses)
 (cyclic voltammetry in lithium perchlorate-propylene carbonate
 electrolyte: polymers and copolymers of pyrrole and
 thiophene as electrodes in lithium cells)
- IT 7791-03-9, Lithium perchlorate
 RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
 (cyclic voltammetry of polypyrrole and polypyrrole-polythiophene
 bilayers and pyrrole-thiophene copolymers in lithium
 perchlorate-propylene carbonate **electrolyte**)
- IT 30604-81-0, Polypyrrole
 RL: DEV (Device component use); PRP (Properties); RCT (Reactant);
 RACT (Reactant or reagent); USES (Uses)
 (cyclic voltammetry of polypyrrole and polypyrrole-polythiophene
 bilayers in lithium perchlorate-propylene carbonate
 electrolyte: polymers and copolymers of pyrrole and
 thiophene as electrodes in lithium cells)
- IT 25233-34-5, Polythiophene
 RL: DEV (Device component use); PRP (Properties); RCT (Reactant);
 RACT (Reactant or reagent); USES (Uses)
 (cyclic voltammetry of polypyrrole-polythiophene bilayers in
 lithium perchlorate-propylene carbonate **electrolyte**:
 polymers and copolymers of pyrrole and thiophene as electrodes in
 lithium cells)
- IT 110-02-1, Thiophene
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
 (electrochem. polymn. with and without pyrrole in lithium
 perchlorate-propylene carbonate **electrolyte**)
- IT 109-97-7, Pyrrole
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
 (electrochem. polymn. with and without thiophene in lithium
 perchlorate-propylene carbonate **electrolyte**)
- IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (polymers and copolymers of pyrrole and thiophene as electrodes
 in lithium cells)

L117 ANSWER 13 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1997:129574 HCAPLUS

DOCUMENT NUMBER: 126:133588

TITLE: Nonaqueous **electrolyte**
batteries using **electrolytes**
containing self discharge inhibitors

INVENTOR(S): Jinno, Maruo; Uehara, Mayumi; Sakurai, Atsushi;
Nishio, Koji; Saito, Toshihiko

PATENT ASSIGNEE(S): Sanyo Denki Kk, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 08321312	A2	19961203	JP 1995-150844	19950524

PRIORITY APPLN. INFO.: JP 1995-150844

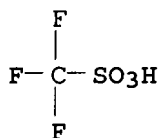
AB Li batteries use electrolytes contg. LiCF₃SO₃ or LiPF₆ dissolved in high dielec. const. solvent selected from ethylene carbonate, propylene carbonate, and butylene carbonate; where the electrolytes contain 1-20 vol.% additive selected from triethylamine, n-butylamine, aniline, tri-Me hydroxylamine, 1-dimethylamino-2-methoxy ethane, acetonitrile, acrylonitrile, 3-methoxy propionitrile, benzonitrile, nitromethane, nitroethane, N,N-dimethylacetamide, N,N-dimethylformamide, formamide, N-methyl-2-pyrrolidone, N,N'-dimethyl imidazolidinone, isoxazole, 3,5-di-Me isoxazole, 3-methyl-2-oxazolidone, 1,2,3-oxadiazole, N-Me morpholine, di-Me sulfide, Et Me sulfide, 2-Me thiophene, 1-butane thiol, benzenethiol, di-Me sulfate, di-Et sulfate, di-Me sulfite, di-Et sulfite, butadienesulfone, 3-Me sulfolene, 1,4-thioxane, phenoxathiin, 1,4-thiazine, thiomorpholine, pyridine, 1,3-dimethyl-2-imidazolidinone, DMSO, di-Me sulfone, Me Et sulfonate, and di-Me sulfinite. The electrolytes may contain 1,2-dimethoxyethane. Since the additives react with Li in anodes and the solvents and the solutes in the electrolytes to form coatings on the anodes for prevention of the reaction between the electrolytes and the anodes, the batteries have improved storage property. These batteries have long shelf life.

IT 7439-93-2, Lithium, uses 33454-82-9, Lithium trifluoromethanesulfonate
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte solns. contg. self discharge inhibitors for lithium batteries)

RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

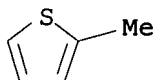
Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 554-14-3, 2-Methylthiophene
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (self discharge inhibitors in nonaq. electrolyte solns.
 for lithium batteries)
 RN 554-14-3 HCAPLUS
 CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M006-16
 ICS H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery electrolyte self discharge inhibitor
 IT Battery electrolytes
 (self discharge inhibitors in nonaq. electrolyte solns.
 for lithium batteries)
 IT 7439-93-2, Lithium, uses 21324-40-3, Lithium
 hexafluorophosphate 33454-82-9, Lithium
 trifluoromethanesulfonate
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte solns. contg. self discharge
 inhibitors for lithium batteries)
 IT 62-53-3, Aniline, uses 64-67-5, Diethyl sulfate 67-68-5,
 Dimethylsulfoxide, uses 67-71-0, Dimethylsulfone 68-12-2,
 N,N-Dimethylformamide, uses 75-05-8, Acetonitrile, uses 75-12-7,
 Formamide, uses 75-18-3, Dimethylsulfide 75-52-5, Nitromethane,
 uses 77-78-1, Dimethyl sulfate 79-24-3, Nitroethane 80-73-9,
 N,N'-Dimethylimidazolidinone 100-47-0, Benzonitrile, uses
 107-13-1, Acrylonitrile, uses 108-98-5, Benzenethiol, uses
 109-02-4, N-Methylmorpholine 109-73-9, n-Butylamine, uses
 109-79-5, 1-Butanethiol 110-67-8, 3-Methoxypropionitrile
 110-86-1, Pyridine, uses 121-44-8, Triethylamine, uses 123-90-0,
 Thiomorpholine 127-19-5, N,N-Dimethylacetamide 262-20-4,
 Phenoxathiin 288-14-2, Isoxazole 288-43-7, 1,2,3-Oxadiazole
 290-56-2, 1,4-Thiazine 290-57-3, 1,4-Thiazine 300-87-8,
 3,5-Dimethylisoxazole 554-14-3, 2-Methylthiophene
 616-42-2, Dimethyl sulfite 623-81-4, Diethyl sulfite 624-89-5,
 Ethylmethylsulfide 666-15-9 872-50-4, N-Methyl-2-pyrrolidone,
 uses 1193-10-8, 3-Methylsulfolene 1912-28-3, Methyl ethyl
 sulfonate 3030-44-2 5669-39-6, Trimethylhydroxylamine
 15980-15-1, 1,4-Thioxane 19836-78-3 28452-93-9, Butadienesulfone
 RL: DEV (Device component use); MOA (Modifier or additive use); USES

(Uses)

(self discharge inhibitors in nonaq. **electrolyte** solns.
for lithium **batteries**)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
110-71-4, 1,2-Dimethoxyethane 4437-85-8, Butylene carbonate
RL: DEV (Device component use); USES (Uses)
(solvents for nonaq. **electrolyte** solns. contg. self
discharge inhibitors for lithium **batteries**)

L117 ANSWER 14 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1996:560789 HCAPLUS

DOCUMENT NUMBER: 125:226559

TITLE: Solid polymer **electrolyte** having
increased conductivity and solid-state
battery including this
electrolyte

INVENTOR(S): Walker, Charles W. , Jr.; Plichta, Edward J.;
Behl, Wishvender K.

PATENT ASSIGNEE(S): United States Dept. of the Army, USA

SOURCE: Statutory Invent. Regist., 3 pp.

CODEN: SRXXEV

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 1576	H1	19960806	US 1994-315213	199403 07

PRIORITY APPLN. INFO.: <--
US 1994-315213

199403
07

AB The **electrolyte** includes a soln. of ≥ 1 Li
salt in ≥ 1 polymer host and a dispersion of a Li
ion-conducting solid ceramic material $\text{Li}_{3+x}\text{Ge}_x\text{V}_{1-x}\text{O}_4$ ($x = 0.2-0.8$)
or $\text{Li}_{3.6}\text{Ge}_{0.6}\text{V}_{0.4}\text{O}_4$. A solid-state **battery** comprises Li,
Li alloy, or Li-intercalating compd. anode; an electrochem. active
metallic inorg. compd. cathode; and the invention
electrolyte.

IT 7439-93-2D, Lithium, polymer complexes
RL: DEV (Device component use); USES (Uses)
(**battery electrolyte** contg. dispersed
germanium lithium vanadium oxide)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 110-02-1D, Thiophene, alkyl derivs., polymers, lithium
complexes
RL: TEM (Technical or engineered material use); USES (Uses)
(**battery electrolyte** contg. dispersed
germanium lithium vanadium oxide)

RN 110-02-1 HCAPLUS
 CN Thiophene (8CI, 9CI) (CA INDEX NAME)

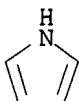


IC ICM H01M006-16
 INCL 429192000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38, 57
 ST **battery electrolyte** lithium polymer complex
 oxide; germanium vanadium lithium oxide **battery
 electrolyte**
 IT **Battery electrolytes**
 (polymer-lithium complexes contg. dispersed germanium lithium
 vanadium oxide)
 IT 7439-93-2D, Lithium, polymer complexes 25322-68-3D, PEO,
 lithium complexes
 RL: DEV (Device component use); USES (Uses)
 (**battery electrolyte** contg. dispersed
 germanium lithium vanadium oxide)
 IT 110-02-1D, Thiophene, alkyl derivs., polymers, lithium
 complexes 9033-83-4D, Polyphenylene, lithium complexes
 25067-58-7D, Polyacetylene, lithium complexes 25233-30-1D,
 Polyaniline, lithium complexes 33411-63-1D, Thiophenol polymer,
 lithium complexes
 RL: TEM (Technical or engineered material use); USES (Uses)
 (**battery electrolyte** contg. dispersed
 germanium lithium vanadium oxide)
 IT 111418-37-2, Germanium lithium vanadium oxide (Ge_{0.6}Li_{3.6}V_{0.4}O₄)
 156166-24-4, Germanium lithium vanadium oxide (Ge_{0.2-0.8}Li_{3.2-3.8}V_{0.2-0.8}O₄)
 RL: MOA (Modifier or additive use); USES (Uses)
 (**battery electrolyte** from polymer-lithium
 complexes contg. dispersed)

L117 ANSWER 15 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 1995:972683 HCAPLUS
 DOCUMENT NUMBER: 124:39959
 TITLE: Impedance analysis of electronically conducting
 polymers
 AUTHOR(S): Ferloni, P.; Mastragostino, M.; Meneghello, L.
 CORPORATE SOURCE: Dep. Physical Chemistry, Pavia Univ., Pavia,
 27100, Italy
 SOURCE: Electrochimica Acta (1996), 41(1),
 27-33
 CODEN: ELCAAV; ISSN: 0013-4686
 PUBLISHER: Elsevier
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB The authors discuss in detail the equiv. circuits used to model the
 impedance of electronically conducting polymer systems and the
 procedure for the impedance anal. of these systems to account for
 deviation from the ideal behavior. Impedance spectra of
 pyrrole-based and thiophene-based polymers of different thickness
 and at different values of injected charge in cells with
 liq. **electrolytes** and solid polymer **electrolytes**

are reported, and the electrochem. parameters are evaluated and discussed.

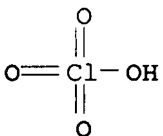
IT 109-97-7, Pyrrole
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
 (electrochem. polymn. on stainless steel in acetonitrile contg. LiClO₄)
 RN 109-97-7 HCAPLUS
 CN 1H-Pyrrole (9CI) (CA INDEX NAME)



IT 7439-93-2D, Lithium, PEO complex
 RL: DEV (Device component use); NUU (Other use, unclassified); PRP (Properties); USES (Uses)
 (electrolyte in solid state cell with conducting polymer in impedance anal. study)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7791-03-9, Lithium perchlorate (LiClO₄)
 RL: DEV (Device component use); NUU (Other use, unclassified); PRP (Properties); USES (Uses)
 (electrolyte with PEO in solid state cell with conducting polymer in impedance anal. study)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

CC 72-2 (Electrochemistry)
 Section cross-reference(s): 35, 36, 76
 IT 109-97-7, Pyrrole 132387-61-2, N-(3,6-Dioxaheptyl)pyrrole
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
 (electrochem. polymn. on stainless steel in acetonitrile contg. LiClO₄)
 IT 7439-93-2D, Lithium, PEO complex 25322-68-3D, PEO, lithium complex
 RL: DEV (Device component use); NUU (Other use, unclassified); PRP (Properties); USES (Uses)
 (electrolyte in solid state cell with conducting polymer in impedance anal. study)

IT 108-32-7, Propylene carbonate
RL: DEV (Device component use); NUU (Other use, unclassified); PRP
(Properties); USES (Uses)
(**electrolyte** with LiClO₄ in cell with conducting
polymer in impedance anal. study)

IT 25322-68-3, PEO
RL: DEV (Device component use); NUU (Other use, unclassified); PRP
(Properties); USES (Uses)
(**electrolyte** with LiClO₄ in solid state cell with
conducting polymer in impedance anal. study)

IT 7791-03-9, Lithium perchlorate (LiClO₄)
RL: DEV (Device component use); NUU (Other use, unclassified); PRP
(Properties); USES (Uses)
(**electrolyte** with PEO in solid state cell with
conducting polymer in impedance anal. study)

L117 ANSWER 16 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:869783 HCAPLUS
DOCUMENT NUMBER: 123:261775
TITLE: Nonaqueous-**electrolyte**
batteries with improved
electrolyte solutions for suppression of
self discharge
INVENTOR(S): Suemori, Atsushi; Shoji, Yoshihiro; Nishio,
Koji; Saito, Toshihiko
PATENT ASSIGNEE(S): Sanyo Electric Co, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 07192756	A2	19950728	JP 1993-327899	199312 24

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PRIORITY APPLN. INFO.: JP 1993-327899

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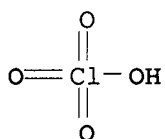
AB The **batteries** consist of cathodes and Li anodes and
electrolytes contg. LiPF₆, LiClO₄, LiCF₃SO₃, LiBF₄, LiAsF₆,
and/or LiN(CF₃SO₂)₂ and solvents contg. ethylene carbonate,
propylene carbonate, butylene carbonate, vinylene carbonate,
1,2-dimethoxyethane, di-Me carbonate, di-Et carbonate, Et Me
carbonate, THF, and/or 1,3-dioxolane, where the **electrolyte**
solns. are added with furan resins. The furan resins may be
phenol-furfural resins, furfural-acetone resins, furfuryl alc.
resins, and/or their derivs. The **batteries** suppress self
discharge and have good storage stability.

IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(anode; nonaq. **electrolyte** solns. contg. furan resins
for Li **batteries** for suppressing self discharge)

RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

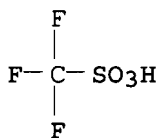
Li

IT 7791-03-9, Lithium perchlorate 33454-82-9, Lithium
trifluoromethanesulfonate 90076-65-6, Lithium
bis(trifluoromethylsulfonyl)amide
RL: DEV (Device component use); USES (Uses)
(electrolyte; nonaq. electrolyte solns.
contg. furan resins for Li batteries for suppressing
self discharge)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



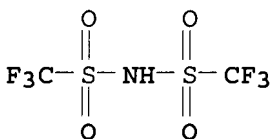
● Li

RN 33454-82-9 HCAPLUS
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
lithium salt (9CI) (CA INDEX NAME)



● Li

IT 110-00-9D, Furan, derivs., polymers

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(nonaq. **electrolyte** solns. contg. furan resins for Li **batteries** for suppressing self discharge)

RN 110-00-9 HCAPLUS

CN Furan (7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery electrolyte** furan resin

IT **Battery electrolytes**

(nonaq. **electrolyte** solns. contg. furan resins for Li **batteries** for suppressing self discharge)

IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)

(anode; nonaq. **electrolyte** solns. contg. furan resins for Li **batteries** for suppressing self discharge)

IT 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6, Lithium bis(trifluoromethylsulfonyl)amide

RL: DEV (Device component use); USES (Uses)

(**electrolyte**; nonaq. **electrolyte** solns. contg. furan resins for Li **batteries** for suppressing self discharge)

IT 110-00-9D, Furan, derivs., polymers 25212-86-6, Furfuryl alcohol homopolymer 25896-95-1, Acetone-furfural copolymer 26338-61-4, Furfural-phenol copolymer

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(nonaq. **electrolyte** solns. contg. furan resins for Li **batteries** for suppressing self discharge)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses 110-71-4, 1,2-Dimethoxyethane 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolan 872-36-6, Vinylene carbonate 4437-85-8, Butylene carbonate

RL: DEV (Device component use); USES (Uses)

(solvent; nonaq. **electrolyte** solns. contg. furan resins for Li **batteries** for suppressing self discharge)

L117 ANSWER 17 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:608855 HCAPLUS

DOCUMENT NUMBER: 123:37139

TITLE: Characterization of the lithium-organic **electrolyte** interface containing inorganic and organic additives by in situ techniques

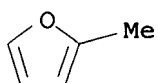
AUTHOR(S): Matsuda, Yoshiharu; Ishikawa, Masashi; Yoshitake, Shinsuke; Morita, Masayuki

CORPORATE SOURCE: Department of Applied Chemistry and Chemical Engineering, Faculty of Engineering, Yamaguchi University, Tokiwadai, Ube, 755, Japan

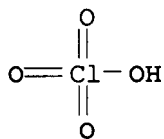
SOURCE: Journal of Power Sources (1995),
54(2), 301-5
CODEN: JPSODZ; ISSN: 0378-7753
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB SnI2 and AlI3 additives improved charge/discharge cycling efficiency of a Li electrode in propylene carbonate **electrolyte** contg. LiClO4. The combination of different types of additive, i.e., the addn. of AlI3 together with 2-methylfuran to the **electrolyte**, resulted in an excellent cycling efficiency of the Li electrode. The electrochem. behavior of an Li electrode-org. **electrolyte** interface was investigated by in-situ techniques, e.g., a.c. impedance measurements and scanning vibrating electrode technique. The relation between the Li rechargeability and the interfacial behavior of the Li electrode in the org. **electrolyte** in the absence and the presence of the additives was discussed.
IT 7439-93-2, Lithium, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(characterization of lithium electrode-org. **electrolyte** interface contg. inorg. and org. additives by in-situ techniques)
RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 534-22-5, 2-Methylfuran
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** contg.; characterization of lithium electrode-org. **electrolyte** interface contg. inorg. and org. additives by in-situ techniques)
RN 534-22-5 HCAPLUS
CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate
RL: TEM (Technical or engineered material use); USES (Uses)
(**electrolyte** contg.; characterization of lithium electrode-org. **electrolyte** interface contg. inorg. and org. additives by in-situ techniques)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
- ST lithium electrode **electrolyte** interface characterization;
tin iodide additive **electrolyte** electrode interface;
aluminum iodide additive **electrolyte** electrode interface;
methylfuran additive **electrolyte** electrode interface;
battery lithium electrode **electrolyte** interface
- IT Interface
(electrode-**electrolyte**, characterization of lithium
electrode-org. **electrolyte** interface contg. inorg. and
org. additives by in-situ techniques)
- IT 7439-93-2, Lithium, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(characterization of lithium electrode-org. **electrolyte**
interface contg. inorg. and org. additives by in-situ techniques)
- IT 534-22-5, 2-Methylfuran 7550-35-8, Lithium bromide
7784-23-8, Aluminum iodide (AlI₃) 10294-70-9, Tin iodide (SnI₂)
10377-51-2, Lithium iodide
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** contg.; characterization of lithium
electrode-org. **electrolyte** interface contg. inorg. and
org. additives by in-situ techniques)
- IT 108-32-7, Propylene carbonate 7791-03-9, Lithium
perchlorate
RL: TEM (Technical or engineered material use); USES (Uses)
(**electrolyte** contg.; characterization of lithium
electrode-org. **electrolyte** interface contg. inorg. and
org. additives by in-situ techniques)

L117 ANSWER 18 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:413815 HCAPLUS

DOCUMENT NUMBER: 121:13815

TITLE: Fluorinated surfactants as additives for lithium
batteries

AUTHOR(S): Lemordant, D.; Ribes, A. Tudela; Willmann, P.
CORPORATE SOURCE: Lab. Energ. et React. aux Interfaces, Univ. P.
et M. Curie, Paris, 75005, Fr.

SOURCE: Power Sources (1993), 14, 69-80
CODEN: POSOAN; ISSN: 0743-7137

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The effects of a fluorinated surface active agent tetraethylammonium
perfluorooctylsulfonate (TEAFOS) on the cycling efficiencies of the
Li electrode in propylene carbonate (PC)/LiClO₄ **electrolyte**
were studied. Cycling Li on an inert support shows very low
efficiency in the absence of any additive. Addn. of org. additives
like benzene or 2-methylthiophene to the **electrolyte** soln.
improved the coulombic efficiency of Li during deposition/dissoln.

cycles. TEAFOS appears to be a very efficient additive as the quantity (in moles) of surfactant required to obtain the same improvement as benzene, for example, is at least one order of magnitude lower. Organo **salts** like **Li** perfluorooctane sulfonate or TEAFOS are sol. in PC and cond. data show that they behave as fully dissocd. salts in highly polar org. solvents like PC. Surprisingly, the variations of the surface tension at the PC/air interface or the contact angle (on glass plates) are apparent only for concn. >0.01 mol/L. In connection with this result, it was found that the efficiency increases with surfactant concn. from 0.01 mol/L up to the concn. of ≈ 0.05 mol/L at satn. at room temp. Addn. of 5% of benzene to the **electrolyte** contg. 0.02 mol/L of TEAFOS lead to a further improvement of the cycling efficiency. The mechanism of action of these lipophilic compds. is similar and related to adsorption at interface.

IT 7439-93-2, Lithium, uses

RL: USES (Uses)

(anodes, cycling efficiency of, in **batteries**, effect of fluorinated surfactants in **electrolyte** on)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

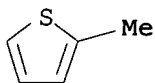
IT 554-14-3, 2-Methylthiophene

RL: USES (Uses)

(**electrolyte** contg., lithium perchlorate, fluorinated surfactants in, for lithium anode cycling efficiency, in **batteries**)

RN 554-14-3 HCAPLUS

CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



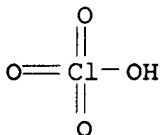
IT 7791-03-9, Lithium perchlorate

RL: USES (Uses)

(**electrolyte**, contg. fluorinated surfactants for lithium anode cycling efficiency, in **batteries**)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 29457-72-5
RL: USES (Uses)
(surfactant, **electrolyte** contg., lithium perchlorate,
for lithium anode cycling efficiency, in **batteries**)
RN 29457-72-5 HCAPLUS
CN 1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-
heptadecafluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)

HO₃S⁻ (CF₂)₇-CF₃

● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fluorinated surfactant lithium **battery** performance;
ethylammonium perfluorooctylsulfonate surfactant lithium
battery performance; benzene additive **electrolyte**
lithium **battery**; methylthiophene additive
electrolyte lithium **battery**
IT **Battery electrolytes**
(lithium perchlorate, contg. fluorinated surfactants, for lithium
anode cycling efficiency, in **batteries**)
IT Anodes
(**battery**, lithium, cycling efficiency of, effect of
fluorinated surfactants in **electrolyte** on)
IT 7439-93-2, Lithium, uses
RL: USES (Uses)
(anodes, cycling efficiency of, in **batteries**, effect of
fluorinated surfactants in **electrolyte** on)
IT 71-43-2, Benzene, uses 108-32-7, Propylene carbonate
554-14-3, 2-Methylthiophene
RL: USES (Uses)
(**electrolyte** contg., lithium perchlorate, fluorinated
surfactants in, for lithium anode cycling efficiency, in
batteries)
IT 7791-03-9, Lithium perchlorate
RL: USES (Uses)
(**electrolyte**, contg. fluorinated surfactants for
lithium anode cycling efficiency, in **batteries**)
IT 29457-72-5 56773-42-3, Tetraethylammonium
perfluorooctylsulfonate 59587-38-1
RL: USES (Uses)
(surfactant, **electrolyte** contg., lithium perchlorate,
for lithium anode cycling efficiency, in **batteries**)

L117 ANSWER 19 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:195809 HCAPLUS

DOCUMENT NUMBER: 120:195809

TITLE: DSC studies pertaining to safety related
chemistry of **secondary Li**
cells

AUTHOR(S): Pasquariello, D. M.; Abraham, K. M.; Willstaedt,
E. B.; Shen, D. H.; Surampudi, S.

CORPORATE SOURCE: EIC Laboratories Inc., Norwood, MA, 02062, USA

SOURCE: Proceedings - Electrochemical Society (
1993), (Proceeding of the Symposium on
Lithium Batteries, 1992), 106-25

CODEN: PESODO; ISSN: 0161-6374

DOCUMENT TYPE: Journal

LANGUAGE: English

AB DSC was used to study the role of components on the safety of **secondary Li/TiS₂ cells**. Cyclic ether/LiAsF₆ **electrolytes** undergo strong exothermic reactions with fresh Li at temps. as low as 140° but cyclic esters do not react at <190°. DSC data from cycled anodes, show that exothermic reactions start at 50° when the **electrolyte** contains cyclic esters and at 100° when cyclic ethers. The difference in reactivity between fresh and cycled Li in the ester **electrolyte** is due to the properties of the passivation layer on the Li surface. DSC data of material removed from a cycled TiS₂ cathode suggests that TiS₂ catalyzes **electrolyte** decompn., but the reaction is not as exothermic as that of the anode. The reactions responsible for the exotherms at the anode and the cathode are important factors for the low heat tolerance of **secondary Li cells**.

IT 7439-93-2, Lithium, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction of, with cyclic ethers and esters in **electrolyte**, effect on safety and heat tolerance of **battery**)

RN 7439-93-2 HCAPLUS

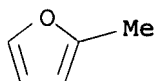
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 534-22-5, 2-Methyl furan
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction of, with lithium, in **electrolyte**, effect on safety and heat tolerance of **battery**)

RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 72

ST safety lithium **battery** exothermic reaction; ester **electrolyte** reaction lithium anode

IT **Battery electrolytes**
 (lithium salts contg. cyclic ethers and cyclic ester solvents, exothermic reaction of lithium with)

IT Safety
 (of lithium **batteries**, role of exothermic reaction of anode with cyclic ethers and esters on)

IT Reaction
 (exothermic, of lithium with cyclic ethers and esters, effect of, on safety of lithium **battery**)

IT 29935-35-1, Lithium hexafluoroarsenate (LiAsF₆)
 RL: USES (Uses)
 (**electrolyte** contg. cyclic ethers or esters and, lithium reaction in)

- IT 66594-52-3, Aluminum 20, lithium 80 68968-16-1 77088-52-9,
Aluminum 15, lithium 85 142241-67-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with cyclic ethers and esters in
electrolyte)
- IT 7439-93-2, Lithium, reactions 12039-13-3, Titanium sulfide
(TiS₂)
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with cyclic ethers and esters in
electrolyte, effect on safety and heat tolerance of
battery)
- IT 96-47-9, 2-Methyl tetrahydrofuran 96-49-1, Ethylene carbonate
108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, reactions
112-49-2, Triglyme 534-22-5, 2-Methyl furan 646-06-0,
Dioxolane
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with lithium, in **electrolyte**, effect on
safety and heat tolerance of **battery**)

L117 ANSWER 20 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:195807 HCAPLUS

DOCUMENT NUMBER: 120:195807

TITLE: Li/LixCoO₂ rechargeable cell:
influence of **electrolyte** composition
and additives on performance

AUTHOR(S): Peled, E.; Menachem, C.; Gorenshtein, A.; Alkon,
A.

CORPORATE SOURCE: Sch. Chem., Tel Aviv Univ., Tel Aviv, 69978,
Israel

SOURCE: Proceedings - Electrochemical Society (
1993), 93-24 (Proceeding of the Symposium
on Lithium Batteries, 1992), 68-74
CODEN: PESODO; ISSN: 0161-6374

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The compatibility of Li anode and LiCoO₂ intercalation cathode with
4 2-Me-furan (I) **electrolytes** were studied. The
electrolytes were LiAsF₆ in I, LiAsF₆ and LiBF₄ in I, LiAsF₆
in I/ di-Me-carbonate (II), and LiAsF₆ and LiBF₄ in I/II. The
II-free **electrolytes** showed poor compatibility with Li.
The **electrolyte** contg. LiBF₄ exhibited the best
compatibility with Li but the poorest compatibility with the LiCoO₂
cathode. Modified cathodes were prepd. by backing CoCO₃, Li₂CO₃,
and CaCO₃ mixt. with a Li:Ca ratio of 1.0:0.6, at 900°; Ca
was present as CaO in the final cathode mix. The presence of CaO
seems to aid in using the **electrolyte** with LiAsF₆/LiBF₄ in
I/II which has the best compatibility with Li. The CaO additive led
to enhanced current efficiency and cathode utilization and slowed
down the degrdn. rate of cathode materials.

IT 7439-93-2, Lithium, uses

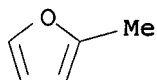
RL: USES (Uses)
(anodes, compatibility of **electrolyte** of
lithium salts with 2-Me-furan and
di-Me-carbonate with)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 534-22-5, 2-Methyl-furan
 RL: USES (Uses)
 (electrolyte contg., lithium anode compatibility with)
 RN 534-22-5 HCAPLUS
 CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 72
 ST methylfuran electrolyte lithium intercalation
 battery; calcium oxide additive intercalation cathode;
 cobalt lithium oxide intercalation cathode
 IT Battery electrolytes
 (lithium salts with 2-Me-furan and
 di-Me-carbonate, anode compatibility with)
 IT Cathodes
 (battery, cobalt lithium oxide, lithium-intercalating,
 additive for stabilization of)
 IT Anodes
 (battery, lithium, compatibility of electrolyte
 of lithium salts with 2-Me-furan and
 di-Me-carbonate with)
 IT 7439-93-2, Lithium, uses
 RL: USES (Uses)
 (anodes, compatibility of electrolyte of
 lithium salts with 2-Me-furan and
 di-Me-carbonate with)
 IT 534-22-5, 2-Methyl-furan 616-38-6, Dimethyl-carbonate
 14283-07-9, Lithium fluoroborate (LiBF₄) 29935-35-1, Lithium
 hexafluoroarsenate (LiAsF₆)
 RL: USES (Uses)
 (electrolyte contg., lithium anode compatibility with)

L117 ANSWER 21 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 1993:584681 HCAPLUS
 DOCUMENT NUMBER: 119:184681
 TITLE: Behavior of lithium/electrolyte
 interface in organic solutions
 AUTHOR(S): Matsuda, Yoshiharu
 CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, 755, Japan
 SOURCE: Journal of Power Sources (1993),
 43(1-3), 1-7
 CODEN: JPSODZ; ISSN: 0378-7753
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The coulombic efficiency of a Li anode in Li salt
 -org. solvent electrolytes was improved by addn. of Mg²⁺,
 Zn²⁺, In³⁺, Ga³⁺, etc. Some org. additives, e.g.,
 2-methylthiophene, 2-methylfuran, benzene, etc., also improved the
 coulombic efficiency of Li anodes during cycling. The mechanisms of
 these additives are discussed in connection with the structure of
 the electrode/electrolyte interface.
 IT 7439-93-2, Lithium, uses
 RL: USES (Uses)

(anodes, interface of org. **electrolyte** with, effect of additives on)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

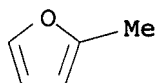
IT 534-22-5, 2-Methyl furan 554-14-3, 2-Methyl thiophene

RL: USES (Uses)

(**electrolyte** contg. org. solvent and **lithium salt** and, **lithium** anode coulombic efficiency in)

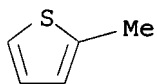
RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



RN 554-14-3 HCAPLUS

CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



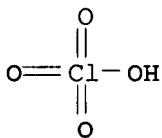
IT 7791-03-9, Lithium perchlorate (LiClO₄)

RL: USES (Uses)

(**electrolyte** contg. org. solvent and, **lithium** anode interface with, effect of additives on)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST lithium anode interface **electrolyte** additive;
battery lithium anode **electrolyte** interface

IT **Battery electrolytes**
(**lithium salt**-org. solvent, with inorg. and
org. additives, **lithium** anode interface with)

IT Electric resistance

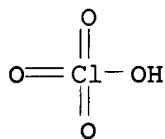
- (of lithium anode/org. solvent **electrolyte**, effect of additives on)
- IT Anodes
(**battery**, lithium, interface with additive-contg. lithium salt-org. solvent **electrolyte**, properties of)
- IT Interface
(electrode-**electrolyte**, lithium anode/org. solvent, effect of additives on)
- IT 7439-93-2, Lithium, uses
RL: USES (Uses)
(anodes, interface of org. **electrolyte** with, effect of additives on)
- IT 108-32-7, Propylene carbonate
RL: USES (Uses)
(**electrolyte** contg. lithium perchlorate and, lithium anode interface with, effect of additives on)
- IT 71-43-2, Benzene, uses 534-22-5, 2-Methyl furan
554-14-3, 2-Methyl thiophene 7429-90-5, Aluminum, uses
7439-95-4, Magnesium, uses 7440-31-5, Tin, uses 7440-55-3, Gallium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses
7440-74-6, Indium, uses
RL: USES (Uses)
(**electrolyte** contg. org. solvent and lithium salt and, lithium anode coulombic efficiency in)
- IT 7791-03-9, Lithium perchlorate (LiClO₄)
RL: USES (Uses)
(**electrolyte** contg. org. solvent and, lithium anode interface with, effect of additives on)

L117 ANSWER 22 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1993:563959 HCAPLUS
DOCUMENT NUMBER: 119:163959
TITLE: Electrochemical study of the passivating layer on lithium intercalated carbon electrodes in nonaqueous solvents
AUTHOR(S): Simon, B.; Boeue, J. P.; Broussely, M.
CORPORATE SOURCE: Alcatel Alsthom Recherche, Marcoussis, 91640, Fr.
SOURCE: Journal of Power Sources (1993), 43(1-3), 65-74
CODEN: JPSODZ; ISSN: 0378-7753
DOCUMENT TYPE: Journal
LANGUAGE: English

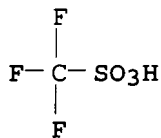
- AB Passivation of graphitized C electrodes was studied by impedance spectroscopy to det. the double layer capacitance and charge transfer characteristics of Li-intercalated C anodes. The graphitized C films were obtained from polyacrylonitrile. The reactions of **electrolyte** components during the intercalation cycles were studied to det. the origin of the passivating species. Solubilization of the passivating layer in the **electrolyte** appeared to be the main mechanism of self-discharge; several **electrolyte** additives were identified which were efficient for charge retention in button-type Li-C tissue **batteries**.
- IT 7791-03-9, Lithium perchlorate (LiClO₄) 33454-82-9
RL: USES (Uses)
(**electrolyte** contg., graphitized carbon anode passivation in)

RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 25154-40-9, Methyl thiophene
 RL: USES (Uses)
 (electrolyte contg., lithium salt
 -org. solvent, graphitized carbon anode passivation in)
 RN 25154-40-9 HCAPLUS
 CN Thiophene, methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



D1-Me

IT 7439-93-2, Lithium, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (intercalation of, in graphitized carbon anodes, passivating
 layer formation during)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

- Section cross-reference(s): 72
- ST lithium intercalation graphitized carbon anode; graphitized carbon anode passivation **electrolyte**; **battery** graphitized carbon anode
- IT **Battery electrolytes**
(lithium salt-org. solvent, graphitized carbon anode passivation in, additives for minimization of)
- IT Passivation
(of graphitized carbon anodes during lithium intercalation, **electrolyte** role in)
- IT Reduction, electrochemical
(of lithium salt-org. solvent **electrolytes**, in cycling of lithium-intercalating carbon)
- IT Anodes
(**battery**, graphitized carbon, lithium-intercalating, stability of)
- IT 7782-42-5P, Graphite, uses
RL: PREP (Preparation); USES (Uses)
(anodes, lithium-intercalating, passivating layer on, formation and properties of, for **batteries**)
- IT 75-18-3 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 109-99-9, THF, uses 110-71-4, 1,2-Dimethoxyethane **7791-03-9**, Lithium perchlorate (LiClO₄) 29935-35-1, Lithium hexafluoroarsenate (LiAsF₆) **33454-82-9**
RL: USES (Uses)
(**electrolyte** contg., graphitized carbon anode passivation in)
- IT 124-38-9, Carbon dioxide, uses 306-94-5, Perfluorodecalin 624-91-9, Methyl nitrite 1120-71-4, Propane sultone **25154-40-9**, Methyl thiophene
RL: USES (Uses)
(**electrolyte** contg., lithium salt -org. solvent, graphitized carbon anode passivation in)
- IT 7440-44-0P, Carbon, uses
RL: PREP (Preparation); USES (Uses)
(graphitized, anodes, lithium-intercalating, passivating layer on, formation and properties of, for **batteries**)
- IT **7439-93-2**, Lithium, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(intercalation of, in graphitized carbon anodes, passivating layer formation during)

L117 ANSWER 23 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1993:542922 HCAPLUS

DOCUMENT NUMBER: 119:142922

TITLE: Lithium insertion into titanium sulfide (TiS₂) from various **electrolytes**

AUTHOR(S): Skundin, A. M.; Stefanovskaya, E. E.; Egorkina, O. Yu.

CORPORATE SOURCE: A. N. Frumkin Inst. Electrochem., Moscow, 117071, Russia

SOURCE: Journal of Power Sources (1993), 43(1-3), 301-6
CODEN: JPSODZ; ISSN: 0378-7753

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The quasi-equil. behavior of TiS₂ cathodes in various **electrolytes** was studied, and the galvanostatic switch-on transients in these **electrolytes** were measured. The

electrolytes used were: 1M LiCl₄ in propylene carbonate and in γ -butyrolactone (BL), 1M LiBF₄ in BL, and 1M LiAsF₆ in a mixt. of 2-methyltetrahydrofuran and 2-methylfuran. Both the potential of the intercalate Li_xTiS₂ with fixed x values and the diffusivity of the intercalating species are dependent on the nature of the **electrolyte**.

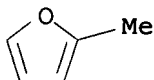
IT 534-22-5, 2-Methylfuran

RL: USES (Uses)

(**electrolyte** contg., lithium hexafluoroarsenate, lithium intercalation in titanium sulfide cathodes during **battery** discharge in relation to)

RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



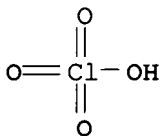
IT 7791-03-9, Lithium perchlorate

RL: USES (Uses)

(**electrolyte**, lithium intercalation in titanium sulfide cathodes during **battery** discharge in relation to)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 7439-93-2, Lithium, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(intercalation of, in titanium disulfide cathodes during **battery** discharge, **electrolyte** effect on)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST lithium intercalation titanium sulfide cathode **electrolyte**
; **battery** lithium intercalation titanium sulfide cathode

IT **Battery electrolytes**

(lithium intercalation in titanium sulfide cathodes during discharge in relation to)

IT Cathodes

(**battery**, titanium sulfide, performance of, **electrolyte** effect on)

- IT Inclusion reaction
(intercalation, electrochem., of lithium, in titanium disulfide cathodes during **battery** discharge, **electrolyte** effect on)
- IT 12039-13-3, Titanium sulfide (TiS₂)
RL: USES (Uses)
(cathodes, performance of, **electrolyte** effect on)
- IT 96-47-9, 2-Methyltetrahydrofuran 534-22-5, 2-Methylfuran
RL: USES (Uses)
(**electrolyte** contg., lithium hexafluoroarsenate, lithium intercalation in titanium sulfide cathodes during **battery** discharge in relation to)
- IT 96-48-0, γ -Butyrolactone
RL: USES (Uses)
(**electrolyte** contg., lithium intercalation in titanium sulfide cathodes during **battery** discharge in relation to)
- IT 108-32-7, Propylene carbonate
RL: USES (Uses)
(**electrolyte** contg., lithium perchlorate, lithium intercalation in titanium sulfide cathodes during **battery** discharge in relation to)
- IT 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate (LiBF₄) 29935-35-1, Lithium hexafluoroarsenate (LiAsF₆)
RL: USES (Uses)
(**electrolyte**, lithium intercalation in titanium sulfide cathodes during **battery** discharge in relation to)
- IT 7439-93-2, Lithium, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(intercalation of, in titanium disulfide cathodes during **battery** discharge, **electrolyte** effect on)

L117 ANSWER 24 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 1992:637171 HCAPLUS
 DOCUMENT NUMBER: 117:237171
 TITLE: Secondary lithium **batteries**
 INVENTOR(S): Sugeno, Naoyuki; Anzai, Masanori; Nagaura, Toru
 PATENT ASSIGNEE(S): Sony Corp., Japan
 SOURCE: Eur. Pat. Appl., 18 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 486950	A1	19920527	EP 1991-119471	199111 14
			<--	
EP 486950	B1	19940810		
R: DE, FR, GB				
JP 04184872	A2	19920701	JP 1990-312481	199011 17
			<--	
JP 3089662	B2	20000918		

JP 2000268864 A2 20000929 JP 2000-65779 199011
17

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JP 3356157 B2 20021209
JP 04280082 A2 19921006 JP 1991-67998 199103
07

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JP 3079613 B2 20000821
CA 2055305 AA 19920518 CA 1991-2055305 199111
12

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CA 2055305 C 20020219
US 5292601 A 19940308 US 1991-792628 199111
15

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PRIORITY APPLN. INFO.: JP 1990-312481 A 199011
17

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JP 1991-67998 A 199103
07

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AB The **batteries** have Li-intercalatable carbonaceous anodes,
LixMO2 cathodes (x = 0.5-1, M = Co, Ni, and/or Mn), and
electrolyte contg. a mixed solvent of 15-75 vol.% propylene
carbonate and di-Et and/or di-Pr carbonate. The carbonaceous
material is obtained from furan resins and petroleum pitches and has
a spacing of (002) planes of ≥ 3.70 Å and any DTA
exothermic peak at $\geq 700^\circ$. The carbonaceous material
further comprises 0.2-5.0 wt.% P and 0.2-2.0 wt.% B.

IT 110-00-9D, Furan, derivs., polymers
RL: USES (Uses)
(carbonaceous materials from, for lithium-intercalating anodes,
in **batteries**)

RN 110-00-9 HCAPLUS
CN Furan (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, uses
RL: USES (Uses)
(carbonaceous materials intercalated with, anodes, for
batteries)

RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IC ICM H01M010-40

ICS H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium intercalating carbonaceous anode **battery**; nickel
 lithium oxide **battery** cathode; cobalt lithium oxide
battery cathode; manganese lithium oxide **battery**
 cathode; phosphorus carbonaceous material lithium anode; boron
 carbonaceous material lithium anode; diethyl carbonate
battery electrolyte solvent; dipropyl carbonate
battery electrolyte solvent; propylene carbonate
battery electrolyte solvent
 IT **Battery electrolytes**
 (lithium salts, solvent mixts. for)
 IT **Batteries**, secondary
 (lithium, performance of)
 IT Carbonaceous materials
 RL: USES (Uses)
 (lithium-intercalated, anodes, for **batteries**)
 IT Cathodes
 (**battery**, lithium transition metal oxide)
 IT Anodes
 (**battery**, lithium-intercalated carbonaceous materials
 for)
 IT Pitch
 (petroleum, lithium-intercalated, anodes, for **batteries**
)
 IT 110-00-9D, Furan, derivs., polymers
 RL: USES (Uses)
 (carbonaceous materials from, for lithium-intercalating anodes,
 in **batteries**)
 IT 7439-93-2, Lithium, uses
 RL: USES (Uses)
 (carbonaceous materials intercalated with, anodes, for
batteries)
 IT 12031-65-1, Lithium nickel oxide (LiNiO₂) 12057-17-9, Lithium
 manganese oxide (LiMn₂O₄) 12190-79-3, Cobalt lithium oxide
 (CoLiO₂) 56369-20-1, M = Co 123193-61-3, Cobalt lithium oxide
 (CoLi_{0.5}-102) 123550-86-7, Lithium manganese oxide (Li_{0.5}-1MnO₂)
 144566-63-2, Lithium nickel oxide (Li_{0.5}-1NiO₂)
 RL: DEV (Device component use); USES (Uses)
 (cathodes, for secondary lithium **batteries**)
 IT 105-58-8, Diethyl carbonate 623-96-1, Dipropyl carbonate
 RL: USES (Uses)
 (**electrolyte** solvent contg., propylene carbonate, for
 lithium **batteries**)
 IT 108-32-7, Propylene carbonate
 RL: USES (Uses)
 (**electrolyte** solvent, contg. di-Et and/or di-Pr
 carbonate lithium **batteries**)
 IT 7440-42-8, Boron, uses 7723-14-0, Phosphorus, uses
 RL: USES (Uses)
 (lithium-intercalated carbonaceous anodes contg., for secondary
batteries)

L117 ANSWER 25 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1992:161080 HCAPLUS

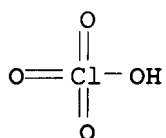
DOCUMENT NUMBER: 116:161080

TITLE: Properties of electrochemically synthesized
 polymer electrodes. Part VIII. Kinetics of
 polypyrrole in polymer **electrolyte**
cells

AUTHOR(S): Casagrande, C.; Panero, S.; Prosperi, P.; Scrosati, B.
 CORPORATE SOURCE: Dip. Chim., Univ. Roma 'La Sapienza', Rome, 00185, Italy
 SOURCE: Journal of Applied Electrochemistry (1992), 22(3), 195-9
 CODEN: JAELEBJ; ISSN: 0021-891X
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Results obtained by cyclic voltammetry and frequency response anal. show that the electrochem. behavior of solid state cells based on the combination of polymer electrolytes and polymer cathodes is crucially affected by the morphol. of the electrode interfaces. Fast kinetics and good interfacial contacts can be obtained using composite electrodes electrosynthesized from solns. contg. a polymer electrolyte and large surfactant anions.
 IT 7439-93-2D, Lithium, polyethylene complex
 RL: PRP (Properties)
 (electrochem. polymn. of pyrrole in acetonitrile contg. lithium perchlorate and)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7791-03-9, Lithium perchlorate
 RL: PRP (Properties)
 (electrochem. polymn. of pyrrole in acetonitrile contg., with or without polyethylene oxide and sodium dodecyl sulfate)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 109-97-7, Pyrrole
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (polymn. of, electrochem., with polyethylene oxide and sodium dodecyl sulfate)
 RN 109-97-7 HCAPLUS
 CN 1H-Pyrrole (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 36, 52

ST polypyrrole redox polymer **electrolyte cell**;
polyethylene oxide sodium dodecyl sulfate **electrolyte**;
elec impedance polypyrrole cell

IT 7439-93-2D, Lithium, polyethylene complex 25322-68-3,
Polyethylene oxide 25322-68-3D, Polyethylene oxide, lithium
complex
RL: PRP (Properties)
(electrochem. polymn. of pyrrole in acetonitrile contg. lithium
perchlorate and)

IT 7791-03-9, Lithium perchlorate
RL: PRP (Properties)
(electrochem. polymn. of pyrrole in acetonitrile contg., with or
without polyethylene oxide and sodium dodecyl sulfate)

IT 109-97-7, Pyrrole
RL: RCT (Reactant); RACT (Reactant or reagent)
(polymn. of, electrochem., with polyethylene oxide and sodium
dodecyl sulfate)

L117 ANSWER 26 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1991:563107 HCAPLUS
DOCUMENT NUMBER: 115:163107
TITLE: Mixed-solvent **electrolytes** for
ambient-temperature secondary lithium
batteries
INVENTOR(S): Shen, David H.; Surampudi, Subbarao;
Deligiannis, Fotios; Halpert, Gerald
PATENT ASSIGNEE(S): California Institute of Technology, USA
SOURCE: U.S., 11 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 5030528	A	19910709	US 1990-520265	199005 07

PRIORITY APPLN. INFO.: <--
US 1990-520265
199005
07

AB The **electrolytes** comprise a solvent of a mixt. of ethylene
carbonate .apprx.5-30 vol.%, EPDM rubber .apprx.0.01-0.1 wt.%,
2-methylfuran .apprx.0.2-2 vol.%, and balance 2-
methylnetetrahydrofuran and a conductive Li salt
(esp. 1.0-1.8M LiAsF₆) solute. The **electrolyte** has a high
cond. and is less corrosive to Li and Li alloy anodes. The cathode
is a mixt. of EPDM rubber and a compd. selected from TiS₂, NbSe₃,
V₆O₁₃, V₂O₅, MoS₂, MoS₃, CoO₂, and CrO₂.

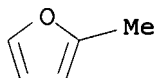
IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(anodes, in **batteries** with **electrolytes**
contg. mixed org. solvents)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 534-22-5, 2-Methylfuran
RL: USES (Uses)
(**electrolyte** contg., for secondary lithium
batteries)
RN 534-22-5 HCAPLUS
CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M006-16
INCL 429197000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** lithium nonaq **electrolyte** solvent; furan
methyl lithium **battery electrolyte**; THF methyl
lithium **battery electrolyte**; EPDM rubber lithium
battery electrolyte; ethylene carbonate lithium
battery electrolyte
IT **Batteries**, secondary
(lithium, high-performance, with **electrolytes** contg.
mixed org. solvents)
IT Rubber, synthetic
RL: USES (Uses)
(EPDM, **electrolyte** contg., nonaq., for secondary
lithium **batteries**)
IT 7439-93-2, Lithium, uses and miscellaneous 12798-95-7
53680-59-4
RL: USES (Uses)
(anodes, in **batteries** with **electrolytes**
contg. mixed org. solvents)
IT 1314-62-1, Vanadium pentoxide, uses and miscellaneous 1317-33-5,
Molybdenum disulfide, uses and miscellaneous 12017-00-4, Cobalt
dioxide 12018-01-8, Chromium dioxide 12033-29-3, Molybdenum
trisulfide 12034-77-4, Niobium diselenide 12037-42-2, Vanadium
oxide (V6O13) 12039-13-3, Titanium disulfide
RL: USES (Uses)
(cathodes, contg. EPDM rubber, in **batteries** with
electrolytes contg. mixed org. solvents)
IT 96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate
534-22-5, 2-Methylfuran
RL: USES (Uses)
(**electrolyte** contg., for secondary lithium
batteries)
IT 74-85-1
RL: USES (Uses)
(rubber, EPDM, **electrolyte** contg., nonaq., for
secondary lithium **batteries**)

L117 ANSWER 27 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1990:467305 HCAPLUS
DOCUMENT NUMBER: 113:67305

TITLE: Performance of the low-current-density-synthesized polypyrrole in lithium cells containing propylene carbonate

AUTHOR(S): Novak, Petr; Vielstich, Wolf

CORPORATE SOURCE: Inst. Phys. Chem., Univ. Bonn, Bonn, D-5300/1, Germany

SOURCE: Journal of the Electrochemical Society (1990), 137(6), 1681-9
CODEN: JESQAN; ISSN: 0013-4651

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The properties of polypyrrole (PPy) films synthesized at very low c.ds. (1-250 $\mu\text{A}/\text{cm}^2$) were investigated. Potentiodynamic cycling, FTIR spectroscopy, and differential electrochem. mass spectroscopy were employed. The use of propylene carbonate (PC) based **electrolytes** for the synthesis results in an incorporation of PC fragments (arising by the electrooxidn. of PC) into the grown polypyrrole film. During subsequent cycling of PPy films in 0.5 M LiClO_4/PC **electrolyte**, the electrochem. oxidn. of PC proceeds parallel with the doping/undoping process. The decrease in c.d. during polymer growth has the same effect as an addn. of small amts. of water into the **electrolyte** for synthesis - the performance of the polymer in **secondary** lithium **cells** is improved.

IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(**battery**, secondary, performance of low-current-d.-prepd. polypyrrole in)

RN 7439-93-2 HCAPLUS

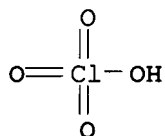
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7791-03-9, Lithium perchlorate
RL: PRP (Properties)
(electrochem. polymn. of pyrrole in propylene carbonate contg.)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

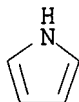


● Li

IT 109-97-7, Pyrrole
RL: RCT (Reactant); RACT (Reactant or reagent)
(polymn. of, electrochem., on glassy carbon or gold or platinum in propylene carbonate contg. lithium perchlorate at low current densities, trace water effect on)

RN 109-97-7 HCAPLUS

CN 1H-Pyrrole (9CI) (CA INDEX NAME)



- CC 72-2 (Electrochemistry)
Section cross-reference(s): 35, 36, 52
- ST polypyrrole electroprepn performance lithium **battery**;
propylene carbonate electrooxidn pyrrole polymn; water effect
pyrrole electropolymn
- IT **Batteries**, secondary
(lithium-polypyrrole)
- IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(**battery**, secondary, performance of
low-current-d.-prepd. polypyrrole in)
- IT 7791-03-9, Lithium perchlorate
RL: PRP (Properties)
(electrochem. polymn. of pyrrole in propylene carbonate contg.)
- IT 108-32-7, Propylene carbonate
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidn. of, in electrochem. polymn. of pyrrole in propylene
carbonate contg. lithium perchlorate, lithium secondary
battery in relation to)
- IT 109-97-7, Pyrrole
RL: RCT (Reactant); RACT (Reactant or reagent)
(polymn. of, electrochem., on glassy carbon or gold or platinum
in propylene carbonate contg. lithium perchlorate at low current
densities, trace water effect on)

L117 ANSWER 28 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1990:142707 HCAPLUS

DOCUMENT NUMBER: 112:142707

TITLE: Effects of organic additives on the a.c.
impedance behavior at the lithium/
electrolyte solution interface

AUTHOR(S): Morita, M.; Aoki, S.; Matsuda, Y.

CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, 755, Japan

SOURCE: Progress in Batteries & Solar Cells (
1989), 8, 98-101

CODEN: PBASDR; ISSN: 0198-7259

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The effect of 2-methylfuran and 2-methylthiophene in propylene
carbonate (I)-based **electrolytes** on the recharge capacity
of Li anodes was investigated. The cycling efficiency of Li anodes
in I/LiClO₄ was improved in presence of the additives. The a.c.
impedance spectra of the Li anode/I-based **electrolyte**
interface suggest that the efficiency enhancement was due to
inhibition of film formation on the surface of the Li anode.

IT 7439-93-2, Lithium, properties

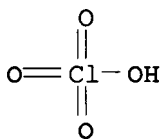
RL: PRP (Properties)
(anodes, cycling behavior of, in propylene carbonate-based
electrolyte contg. org. additives, for **batteries**
)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

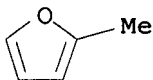
Li

IT 7791-03-9, Lithium perchlorate
 RL: USES (Uses)
 (electrolyte contg., lithium anode cycling in, org.
 compd. additive effect on)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

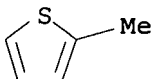


● Li

IT 534-22-5, 2-Methylfuran 554-14-3,
 2-Methylthiophene
 RL: USES (Uses)
 (electrolyte contg., propylene carbonate-based, lithium
 anode cycling in)
 RN 534-22-5 HCAPLUS
 CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)

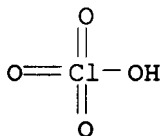


RN 554-14-3 HCAPLUS
 CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76
 ST anode lithium org **electrolyte** interface; methylfuran
electrolyte additive lithium anode; methylthiophene
electrolyte additive lithium anode; **battery**
 lithium anode capacity
 IT Anodes
 (battery, lithium, cycling of, in propylene
 carbonate-based **electrolyte** contg. org. compd.
 additive)
 IT Electric impedance
 (interfacial, of lithium anode/propylene carbonate-based
electrolyte, cyclic org. compd. additive effect on)

- IT 7439-93-2, Lithium, properties
 RL: PRP (Properties)
 (anodes, cycling behavior of, in propylene carbonate-based electrolyte contg. org. additives, for batteries)
- IT 108-32-7, Propylene carbonate 7791-03-9, Lithium perchlorate 21324-40-3, Lithium hexafluorophosphate
 RL: USES (Uses)
 (electrolyte contg., lithium anode cycling in, org. compd. additive effect on)
- IT 534-22-5, 2-Methylfuran 554-14-3, 2-Methylthiophene
 RL: USES (Uses)
 (electrolyte contg., propylene carbonate-based, lithium anode cycling in)
- L117 ANSWER 29 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 1989:582959 HCAPLUS
 DOCUMENT NUMBER: 111:182959
 TITLE: Effects of additives on the electrochemical behavior at the lithium/organic electrolyte interface
 AUTHOR(S): Morita, Masayuki; Aoki, Seiki; Matsuda, Yoshiharu
 CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, 755, Japan
 SOURCE: Denki Kagaku oyobi Kogyo Butsuri Kagaku (1989), 57(6), 523-6
 CODEN: DKOKAZ; ISSN: 0366-9297
 DOCUMENT TYPE: Journal
 LANGUAGE: Japanese
- AB Coulombic efficiency in the charge-discharge cycle of an Li electrode was improved by the addn. of 2-methylfuran, 2-methylthiophene, or 4-methylthiazole to the propylene carbonate/LiClO₄ electrolyte. The a.c. impedance at the Li/org. electrolyte interface showed that the additive is adsorbed on the Li surface to form a film which is responsible for the enhancement of coulombic efficiency.
- IT 7791-03-9, Lithium perchlorate
 RL: PRP (Properties)
 (battery electrolyte contg. with propylene carbonate, electrochem. behavior of, methylfuran and methylthiophene and methylthiazole effect on)
- RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



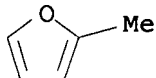
● Li

- IT 534-22-5 554-14-3, 2-Methylthiophene
 RL: PRP (Properties)
 (coulombic efficiency in charge-discharge cycle of lithium

electrode in presence of)

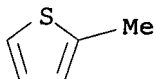
RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



RN 554-14-3 HCAPLUS

CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, uses and miscellaneous

RL: USES (Uses)

(electrodes, coulombic efficiency of, in charge-discharge cycle, methylfuran and methylthiophene and methylthiazole effects on)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 66

ST lithium org **electrolyte** interface additive effect;
methylfuran effect coulombic efficiency lithium electrode;
methylthiophene effect coulombic efficiency lithium electrode;
methylthiazole effect coulombic efficiency lithium electrode

IT Electric impedance

(at interface of lithium and org. **electrolyte**,
adsorption of org. additives in relation to)IT **Batteries**, secondary(lithium, with org. **electrolyte**, effect of additives
on)

IT 7791-03-9, Lithium perchlorate

RL: PRP (Properties)

(battery **electrolyte** contg. with propylene
carbonate, electrochem. behavior of, methylfuran and
methylthiophene and methylthiazole effect on)

IT 108-32-7, Propylene carbonate

RL: PRP (Properties)

(battery **electrolyte** with, with lithium
perchlorate, methylfuran and methylthiophene and methylthiazole
effect on)IT 534-22-5 554-14-3, 2-Methylthiophene 693-95-8,
4-Methylthiazole

RL: PRP (Properties)

(coulombic efficiency in charge-discharge cycle of lithium
electrode in presence of)

IT 7439-93-2, Lithium, uses and miscellaneous

RL: USES (Uses)

(electrodes, coulombic efficiency of, in charge-discharge cycle,

methyolfuran and methylthiophene and methylthiazole effects on)

L117 ANSWER 30 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1989:518141 HCAPLUS

DOCUMENT NUMBER: 111:118141

TITLE: Behavior of the lithium electrode during cycling in nonaqueous solutions

AUTHOR(S): Geronov, Yu.; Zlatilova, P.; Puresheva, B.; Pasquali, M.; Pistoia, G.

CORPORATE SOURCE: Cent. Lab. Electrochem. Power Sources, Sofia, 1040, Bulg.

SOURCE: Journal of Power Sources (1989), 26(3-4), 585-91
CODEN: JPSODZ; ISSN: 0378-7753

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The highest efficiency of Li anode-limited **batteries** at a c.d. of 4 mA/cm² and a charge d. of 2 mA-h/cm² was obtained when LiAsF₆ in THF/2-methyltetrahydrofuran contg. 2 vol.% 2-methyolfuran was used as **electrolyte**. Neither the cell type (glass or metal) nor the kind of cathode material (LiV₃O₈ or LiCr_{0.9}V_{0.1}S₂) had any substantial effect on the efficiency. The changes of polarization resistance, ohmic drop in the soln., and geometric capacitance with cycling were investigated by a galvanostatic pulse method. The method was used successfully to study the passivation of the Li anode during cycling in the ether mixt. **electrolyte**.

IT 7439-93-2, Lithium, properties

RL: PRP (Properties)

(anodes, behavior of, in cycling of **battery** with ether mixt. **electrolyte**)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

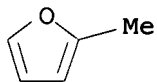
IT 534-22-5, 2-Methyolfuran

RL: USES (Uses)

(electrolyte contg., lithium anode behavior in, in cycling of **battery**)

RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



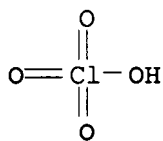
IT 7791-03-9, Lithium perchlorate

RL: USES (Uses)

(electrolyte, in propylene carbonate-ether mixt., lithium anode behavior in, in cycling of **battery**)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST lithium **battery** anode cycling behavior; ether mixt
electrolyte lithium **battery**; passivation lithium
anode nonaq **battery**

IT **Electrolytic** polarization
(anodic-cathodic, of lithium, in cycling of **battery**
with ether mixt. **electrolyte**)

IT Anodes
(**battery**, lithium, cycling behavior of, in ether mixt.
electrolyte)

IT Passivation
(electrochem., of lithium anodes, in cycling of **battery**
with ether mixt. **electrolyte**)

IT 7439-93-2, Lithium, properties
RL: PRP (Properties)
(anodes, behavior of, in cycling of **battery** with ether
mixt. **electrolyte**)

IT 96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate
108-32-7, Propylene carbonate 109-99-9, Thf, properties
110-71-4, Dimethoxyethane 534-22-5, 2-Methylfuran
RL: USES (Uses)
(**electrolyte** contg., lithium anode behavior in, in
cycling of **battery**)

IT 29935-35-1, Lithium hexafluoroarsenate
RL: USES (Uses)
(**electrolyte**, in ether mixt., lithium anode behavior
in, in **battery** cycling)

IT 7791-03-9, Lithium perchlorate
RL: USES (Uses)
(**electrolyte**, in propylene carbonate-ether mixt.,
lithium anode behavior in, in cycling of **battery**)

L117 ANSWER 31 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1989:518140 HCAPLUS

DOCUMENT NUMBER: 111:118140

TITLE: Organic additives for the **electrolytes**
of rechargeable lithium **batteries**

AUTHOR(S): Matsuda, Yoshiharu; Morita, Masayuki

CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, 755, Japan

SOURCE: Journal of Power Sources (1989),
26(3-4), 579-83

CODEN: JPSODZ; ISSN: 0378-7753

DOCUMENT TYPE: Journal

LANGUAGE: English

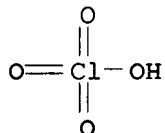
AB The effects of some org. additives contg. hetero-atoms
[2-methylfuran (I), thiophene (II), 2-methylthiophene,
2,5-dimethylthiophene, pyrrole (III), and 4-methylthiazole] in amts.

0.2-1.0 vol.%, on the charge-discharge characteristics of Li anodes were investigated in propylene carbonate (IV) - or DMSO-based **electrolytes**. The addn. of II to IV-based **electrolytes** improved the coulombic efficiency of the cycle, and the addn. of III was effective for cycling in LiPF₆/DMSO. The effect of the addn. of I was significant in the solns. contg. LiPF₆. The coulombic efficiency of the Li anode was detd. by a galvanostatic charge/discharge cycle on a Ni substrate. Based on a.c. impedance behavior of the electrode/**electrolyte** interface, the additive effects are related to changes in the interface structure.

IT 7439-93-2, Lithium, uses and miscellaneous
 RL: USES (Uses)
 (anodes, charge-discharge behavior of, in **electrolytes** contg. heterocyclic compd., for **batteries**)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

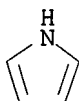
Li

IT 7791-03-9, Lithium perchlorate
 RL: USES (Uses)
 (**electrolytes**, in org. solvents, lithium **battery** anode performance in, heterocyclic compd. additive effect on)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

IT 109-97-7, Pyrrole 110-02-1, Thiophene
 534-22-5, 2-Methylfuran 554-14-3,
 2-Methylthiophene 638-02-8, 2,5-Dimethylthiophene
 RL: USES (Uses)
 (lithium perchlorate-propylene carbonate **electrolyte** contg., charge-discharge behavior of lithium anodes in, for secondary **batteries**)
 RN 109-97-7 HCAPLUS
 CN 1H-Pyrrole (9CI) (CA INDEX NAME)



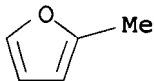
RN 110-02-1 HCAPLUS

CN Thiophene (8CI, 9CI) (CA INDEX NAME)



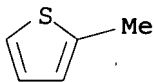
RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



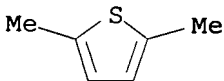
RN 554-14-3 HCAPLUS

CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 638-02-8 HCAPLUS

CN Thiophene, 2,5-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 72, 76
- ST lithium **battery electrolyte** heterocyclic compd;
 anode lithium **battery efficiency electrolyte**
- IT **Batteries**, secondary
 (lithium, heterocyclic compd.-contg. **electrolytes** for)
- IT Electric impedance
 (of lithium electrode in lithium perchlorate-propylene carbonate
electrolyte, thiophene additive effect on)
- IT Anodes
 (**battery**, lithium, charge-discharge behavior of, in
electrolytes contg. heterocyclic compd.)
- IT 7439-93-2, Lithium, uses and miscellaneous
 RL: USES (Uses)
 (anodes, charge-discharge behavior of, in **electrolytes**
 contg. heterocyclic compd., for **batteries**)
- IT 67-68-5, DmsO, uses and miscellaneous 108-32-7, Propylene
 carbonate
 RL: USES (Uses)
 (**electrolytes** contg., lithium anode performance in,
 heterocyclic compd. additive effect on, for rechargeable
batteries)
- IT 7791-03-9, Lithium perchlorate 21324-40-3, Lithium
 hexafluorophosphate
 RL: USES (Uses)

(**electrolytes**, in org. solvents, lithium
battery anode performance in, heterocyclic compd.
additive effect on)

IT 109-97-7, Pyrrole 110-02-1, Thiophene
534-22-5, 2-Methylfuran 554-14-3,
2-Methylthiophene 638-02-8, 2,5-Dimethylthiophene
693-95-8, 4-Methylthiazole
RL: USES (Uses)
(lithium perchlorate-propylene carbonate **electrolyte**
contg., charge-discharge behavior of lithium anodes in, for
secondary **batteries**)

L117 ANSWER 32 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1989:118256 HCAPLUS
DOCUMENT NUMBER: 110:118256
TITLE: Behavior of some additives on secondary lithium
electrode in organic **electrolyte**
AUTHOR(S): Matsuda, Y.; Morita, M.
CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, Japan
SOURCE: Battery Material Symposium, [Proceedings] (
1987), 3, 153-4
CODEN: BMSPEW
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The addn. of crown ethers into the **electrolyte** soln. of
rechargeable Li **batteries** scarcely affected the
charge-discharge cycling efficiency of the Li anode. The addn. of
aliph. ethers into the **electrolyte** did not improve the
coulombic efficiency in charge-discharge cycling of Li anodes,
except in the case of propylene carbonate (I)-LiPF₆ system contg.
di- or triethylene glycol Me ether. The charge-discharge efficiency
was improved by the addn. of thiophene into I-LiClO₄, I-LiPF₆, or
I-THF/LiPF₆; 2-methylfuran into I-LiPF₆, I-THF-LiPF₆, or DMSO-LiPF₆;
pyrrole into I-THF/LiPF₆ or DMSO/LiPF₆; and 4-methylthiazole into
I-LiPF₆.

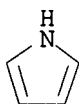
IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(anodes, performance of, in org. **electrolytes** contg.
crown ether and aliph. polyether and unsatd. cyclic compd.
additives, for secondary **battery**)

RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 109-97-7, Pyrrole 110-02-1, Thiophene
534-22-5, 2-Methylfuran 554-14-3,
2-Methylthiophene 638-02-8, 2,5-Dimethylthiophene
RL: USES (Uses)
(**electrolyte** contg., secondary lithium **battery**
performance in relation to)

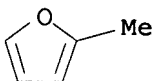
RN 109-97-7 HCAPLUS
CN 1H-Pyrrole (9CI) (CA INDEX NAME)



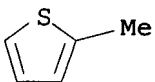
RN 110-02-1 HCAPLUS
CN Thiophene (8CI, 9CI) (CA INDEX NAME)



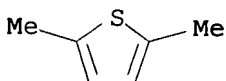
RN 534-22-5 HCAPLUS
CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



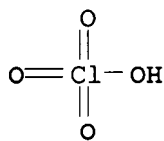
RN 554-14-3 HCAPLUS
CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 638-02-8 HCAPLUS
CN Thiophene, 2,5-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate
RL: USES (Uses)
(electrolytes, in org. solvents, contg. crown ether and
aliph. polyether and unsatd. cyclic compd., secondary lithium
battery performance in relation to)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST lithium **battery** performance **electrolyte**
additive; crown ether additive lithium **battery**; polyether
additive **electrolyte** lithium **battery**; cyclic
compd additive lithium **battery**
- IT **Batteries**, secondary
(lithium, with org. **electrolytes**, performance of, crown
ether and aliph. polyether and unsatd. cyclic compd. effect on)
- IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(anodes, performance of, in org. **electrolytes** contg.
crown ether and aliph. polyether and unsatd. cyclic compd.
additives, for secondary **battery**)
- IT 109-86-4, 2-Methoxyethanol 109-97-7, Pyrrole
110-02-1, Thiophene 111-77-3, Diethylene glycol monomethyl
ether 112-35-6, Triethylene glycol monomethyl ether 294-93-9,
12-Crown-4 534-22-5, 2-Methylfuran 554-14-3,
2-Methylthiophene 638-02-8, 2,5-Dimethylthiophene
693-95-8, 4-Methylthiazole 33100-27-5, 15-Crown-5
RL: USES (Uses)
(**electrolyte** contg., secondary lithium **battery**
performance in relation to)
- IT 109-99-9, Thf, uses and miscellaneous 110-71-4,
1,2-Dimethoxyethane 629-14-1, 1,2-Diethoxyethane 5137-45-1,
1-Ethoxy-2-methoxyethane
RL: USES (Uses)
(**electrolyte** solvent contg., lithium secondary
battery with, additive effect on)
- IT 67-68-5, DmsO, uses and miscellaneous 108-32-7, Propylene
carbonate
RL: USES (Uses)
(**electrolyte** solvent, lithium secondary **battery**
with, additive effect on)
- IT 7791-03-9, Lithium perchlorate 14283-07-9, Lithium
tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
RL: USES (Uses)
(**electrolytes**, in org. solvents, contg. crown ether and
aliph. polyether and unsatd. cyclic compd., secondary lithium
battery performance in relation to)

L117 ANSWER 33 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1989:79266 HCAPLUS

DOCUMENT NUMBER: 110:79266

TITLE: Behavior of some additives on secondary lithium
electrode in organic **electrolytes**

AUTHOR(S): Matsuda, Y.; Morita, M.

CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, 755, Japan

SOURCE: Progress in Batteries & Solar Cells (

1988), 7, 266-70

CODEN: PBASDR; ISSN: 0198-7259

DOCUMENT TYPE:

Journal

LANGUAGE:

English

AB The effect of org. additives to propylene carbonate (I)-based **electrolytes** for secondary Li **batteries** was evaluated in terms of improved cycling efficiency (CE) of the Li anodes. Some aliph. polyethers (THF, 1,2-dimethoxyethane, 1-ethoxy-2-methoxyethane, 1,2-diethoxyethane) added to I, promoted a decrease in the polarization of the Li anode and improved CE, but other aliph. ethers did not. Crown ethers added to the **electrolyte** affected the CE of Li anodes, but the CE of TiS₂ cathodes improved in **electrolytes** contg. crown ethers. The interactions between the additive and **electrolyte**, esp. the counterion had a strong effect on the Li anode, esp. regarding the double layer structure based on species adsorbed on the Li surface. 31245 45123.

IT 7439-93-2, Lithium, uses and miscellaneous

RL: USES (Uses)

(anodes, cycling efficiency of, in propylene carbonate-lithium salt **electrolytes**, org. additive effect on)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 109-97-7, Pyrrole 110-02-1, Thiophene

534-22-5, 2-Methylfuran 554-14-3,

2-Methylthiophene 7791-03-9, Lithium perchlorate (LiClO₄)

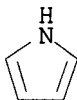
RL: USES (Uses)

(**electrolytes** contg. **lithium salt**

and propylene carbonate and, lithium anode cycling efficiency in)

RN 109-97-7 HCAPLUS

CN 1H-Pyrrole (9CI) (CA INDEX NAME)



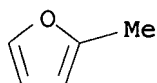
RN 110-02-1 HCAPLUS

CN Thiophene (8CI, 9CI) (CA INDEX NAME)

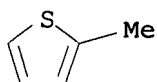


RN 534-22-5 HCAPLUS

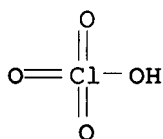
CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



RN 554-14-3 HCAPLUS
 CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 72
 ST propylene carbonate **electrolyte** org additive; lithium
battery propylene carbonate **electrolyte**; anode
 lithium org additive **electrolyte**; ether crown
electrolyte lithium anode; titanium sulfide cathode org
electrolyte
 IT **Batteries**, secondary
 (lithium, propylene carbonate-lithium salt
electrolytes for, org. additive effect on)
 IT Anodes
 (**battery**, lithium, cycling efficiency of, in propylene
 carbonate-lithium salt **electrolyte**,
 org. additive effect on)
 IT 7439-93-2, Lithium, uses and miscellaneous
 RL: USES (Uses)
 (anodes, cycling efficiency of, in propylene carbonate-
 lithium salt **electrolytes**, org.
 additive effect on)
 IT 109-86-4, 2-Methoxyethanol 109-97-7, Pyrrole 109-99-9,
 THF, uses and miscellaneous 110-02-1, Thiophene
 110-71-4, 1,2-Dimethoxyethane 111-77-3, Diethylene glycol
 monomethyl ether 112-35-6, Triethylene glycol monomethyl ether
 294-93-9, 12-Crown-4 534-22-5, 2-Methylfuran
 554-14-3, 2-Methylthiophene 629-14-1, 1,2-Diethoxyethane
 693-95-8, 4-Methylthiazole 5137-45-1, 1-Ethoxy-2-methoxyethane
 7791-03-9, Lithium perchlorate (LiClO₄) 33100-27-5,
 15-Crown-5
 RL: USES (Uses)
 (**electrolytes** contg. lithium salt

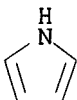
- and propylene carbonate and, lithium anode cycling efficiency in)
- IT 108-32-7, Propylene carbonate
RL: USES (Uses)
(**electrolytes** contg. **lithium salt**
and, org. additives for, lithium anode cycling efficiency in)
- IT 14283-07-9, Lithium tetrafluoroborate (LiBF₄) 29935-35-1, Lithium
hexafluoroarsenate
RL: USES (Uses)
(**electrolytes** contg. propylene carbonate and org.
additive and, lithium anode cycling efficiency in)

L117 ANSWER 34 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1988:207665 HCAPLUS
DOCUMENT NUMBER: 108:207665
TITLE: Addition effects of some organic compounds on
the cycling behavior of lithium electrode
AUTHOR(S): Matsuda, Y.; Hayashida, H.; Morita, M.
CORPORATE SOURCE: Fac. Eng., Yamaguchi Univ., Ube, 755, Japan
SOURCE: Proceedings - Electrochemical Society (
1988), 88-6 (Proc. Symp. Primary Second.
Ambient Temp. Lithium Batteries, 1987), 610-17
CODEN: PESODO; ISSN: 0161-6374
DOCUMENT TYPE: Journal
LANGUAGE: English

- AB The cycling efficiency (CE) of Li anodes was improved by addn. of
org. compds. such as thiophene to propylene carbonate-based
electrolytes. Addn. of pyrrole to DMSO/LiPF₆ also improves
the Li anode CE. The additives induce changes in the structure of
the electrode-~~electrolyte~~ interface involving the
electrode double layer and surface film.
- IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(anodes, improved cycling efficiency of, thiophene and pyrrole
electrolyte additives for)
- RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

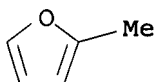
- IT 109-97-7, Pyrrole 110-02-1, Thiophene
534-22-5, 2-Methylfuran 554-14-3,
2-Methylthiophene 638-02-8, 2,5-Dimethylthiophene
RL: USES (Uses)
(**electrolytes** contg., lithium anode cycle efficiency
improvement by)
- RN 109-97-7 HCAPLUS
CN 1H-Pyrrole (9CI) (CA INDEX NAME)



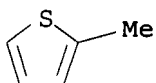
- RN 110-02-1 HCAPLUS
CN Thiophene (8CI, 9CI) (CA INDEX NAME)



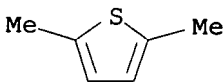
RN 534-22-5 HCAPLUS
CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



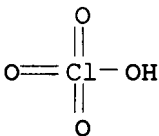
RN 554-14-3 HCAPLUS
CN Thiophene, 2-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 638-02-8 HCAPLUS
CN Thiophene, 2,5-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate (LiClO₄)
RL: USES (Uses)
(**electrolytes** contg., thiophene additive in, lithium anode cycle efficiency in relation to)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
ST lithium anode cycling life additive; thiophene **electrolyte**
lithium anode cycling; pyrrole **electrolyte** lithium anode cycling; **battery** lithium anode cycling life
IT Electric impedance
(of lithium anodes, in DMSO-lithium hexafluorophosphate **electrolytes**, additive effect on)

- IT Anodes
(**battery**, lithium, improved cycling efficiency of, thiophene and pyrrole **electrolyte** additives for)
- IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(anodes, improved cycling efficiency of, thiophene and pyrrole **electrolyte** additives for)
- IT 67-68-5, DMSO, uses and miscellaneous 2537-36-2, Tetramethylammonium perchlorate 21324-40-3, Lithium hexafluorophosphate (LiPF₆)
RL: USES (Uses)
(**electrolytes** contg., additives for, lithium anode cycling efficiency in relation to)
- IT 109-97-7, Pyrrole 109-99-9, THF, uses and miscellaneous 110-02-1, Thiophene 110-71-4 534-22-5, 2-Methylfuran 554-14-3, 2-Methylthiophene 638-02-8, 2,5-Dimethylthiophene 693-95-8, 4-Methylthiazole
RL: USES (Uses)
(**electrolytes** contg., lithium anode cycle efficiency improvement by)
- IT 108-32-7, Propylene carbonate 7791-03-9, Lithium perchlorate (LiClO₄)
RL: USES (Uses)
(**electrolytes** contg., thiophene additive in, lithium anode cycle efficiency in relation to)

L117 ANSWER 35 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1988:64511 HCAPLUS

DOCUMENT NUMBER: 108:64511

TITLE: Oxidation potentials of **electrolyte** solutions for lithium cells

AUTHOR(S): Ossola, F.; Pistoia, G.; Seeber, R.; Ugo, P.

CORPORATE SOURCE: Ist. Chim. Tecnol. Radioelem., C. N. R., Padova, Italy

SOURCE: Electrochimica Acta (1988), 33(1), 47-50

CODEN: ELCAAV; ISSN: 0013-4686

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The oxidn. potentials, Eox of several solns. of interest for nonaq. Li cells were measured by linear sweep voltammetric expts. A correlation is found between Eox and the basicity of the solvents, expressed by their donor nos. (DN). Esters and sulfones have higher resistance to oxidn. than ethers, which possess the highest DN values. All solns. had Eox > 4 V vs. Li/Li+. However, some reactivity between pos. electrodes and solns. was obsd. below this potential.

- IT 7439-93-2, Lithium, uses and miscellaneous
RL: USES (Uses)
(**batteries**, primary, oxidn. potential of **electrolyte** solns. for)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

- IT 12423-04-0
RL: PRP (Properties)

(electrodes, in lithium cells, oxidn. potential of
electrolyte solns. in relation to)

RN 12423-04-0 HCAPLUS

CN Lithium vanadium oxide (LiV3O8) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	8	17778-80-2
V	3	7440-62-2
Li	1	7439-93-2

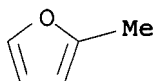
IT 534-22-5, 2-Methylfuran

RL: PRP (Properties)

(oxidn. potential of **electrolyte** solns. of
methylnetetrahydrofuran and THF and, in lithium cells)

RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (8CI, 9CI) (CA INDEX NAME)



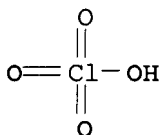
IT 7791-03-9, Lithium perchlorate

RL: PRP (Properties)

(oxidn. potentials of **electrolyte** solns. for lithium
cells contg.)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

CC 72-2 (Electrochemistry)

Section cross-reference(s): 23, 27, 52, 78

ST lithium cell **electrolyte** oxidn potential

IT **Batteries**, primary

(lithium, oxidn. of **electrolyte** solns. in)

IT Cathodes

(teflonized acetylene black, in lithium **batteries**)

IT Electric potential

(oxidn., of **electrolyte** solns., basicity of solvents
effect on)

IT 7439-93-2, Lithium, uses and miscellaneous

RL: USES (Uses)

(**batteries**, primary, oxidn. potential of
electrolyte solns. for)

IT 7440-44-0, Carbon, uses and miscellaneous

RL: USES (Uses)

- (electrode from glassy, in lithium cell, oxidn. potential of **electrolyte** solns. in relation to)
- IT 7440-06-4, Platinum, uses and miscellaneous
RL: USES (Uses)
(electrode, in lithium cells, oxidn. potentials of **electrolyte** solns. in relation to)
- IT 12423-04-0
RL: PRP (Properties)
(electrodes, in lithium cells, oxidn. potential of **electrolyte** solns. in relation to)
- IT 96-47-9, 2-Methyltetrahydrofuran
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of THF and, in lithium cells)
- IT 126-33-0, Sulfolane
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of benzene and, in lithium cells)
- IT 108-32-7, Propylene carbonate
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of dimethoxyethane and, in lithium cells)
- IT 534-22-5, 2-Methylfuran
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of methyltetrahydrofuran and THF and, in lithium cells)
- IT 109-99-9, properties
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of methyltetrahydrofuran and, in lithium cells)
- IT 71-43-2, Benzene, properties
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of sulfolane and, in lithium cells)
- IT 107-31-3, Methylformate
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of, in lithium cells)
- IT 110-71-4, Dimethoxyethane
RL: PRP (Properties)
(oxidn. potential of **electrolyte** solns. of, in presence and in absence of propylene carbonate, in lithium cells)
- IT 7791-03-9, Lithium perchlorate 29935-35-1
RL: PRP (Properties)
(oxidn. potentials of **electrolyte** solns. for lithium cells contg.)

L117 ANSWER 36 OF 36 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1987:543533 HCAPLUS

DOCUMENT NUMBER: 107:143533

TITLE: Characteristics of electrochemically synthesized polymer electrodes in lithium cells - III. Polypyrrole

AUTHOR(S): Panero, S.; Prosperi, P.; Bonino, F.; Scrosati, B.; Corradini, A.; Mastragostino, M.

CORPORATE SOURCE: Dip. Chim., Univ. Roma "La Sapienza", Rome, Italy

SOURCE: Electrochimica Acta (1987), 32(7), 1007-11

CODEN: ELCAAV; ISSN: 0013-4686

DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The characteristics of electrochem. synthesized polypyrrole electrodes were examd. in the LiClO₄-propylene carbonate **electrolyte**, by cyclic voltammetry, charge-discharge cycling, frequency response anal. and by visible-near IR absorption spectra. These polymer electrodes behave satisfactorily in terms of kinetics of the electrochem. doping process, cyclability and charge-discharge efficiency. Their performance under high rates may be limited by the diffusion of the perchlorate counterion. Polypyrrole was more stable than other conducting polymers in org. **electrolytes** of interest for the development of rechargeable Li **batteries**.

IT 7439-93-2, Lithium, uses and miscellaneous
 RL: USES (Uses)
 (battery, secondary, with polypyrrole)

RN 7439-93-2 HCAPLUS

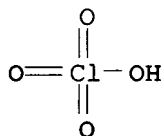
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7791-03-9, Lithium perchlorate
 RL: PRP (Properties)
 (electrochem. redox reaction of perchlorate-doped polypyrrole in propylene carbonate contg., doping-undoping in relation to)

RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

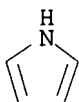


● Li

IT 109-97-7, Pyrrole
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (polymn. of, electrochem., on platinum in acetonitrile contg. lithium perchlorate)

RN 109-97-7 HCAPLUS

CN 1H-Pyrrole (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)

Section cross-reference(s): 35, 36, 52

ST polypyrrole electrogenerated electrode; **battery** lithium polypyrrole; redox electrochem perchlorate doped polypyrrole;

conducting polymer polypyrrole electrodeposition
 IT **Batteries**, secondary
 (lithium-polypyrrole, with propylene carbonate contg. lithium perchlorate)
 IT Cathodes
 (**battery**, polypyrrole)
 IT 7439-93-2, Lithium, uses and miscellaneous
 RL: USES (Uses)
 (**battery**, secondary, with polypyrrole)
 IT 7791-03-9, Lithium perchlorate
 RL: PRP (Properties)
 (electrochem. redox reaction of perchlorate-doped polypyrrole in propylene carbonate contg., doping-undoping in relation to)
 IT 109-97-7, Pyrrole
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (polymn. of, electrochem., on platinum in acetonitrile contg. lithium perchlorate)

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L123 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 2006:689399 HCAPLUS
 DOCUMENT NUMBER: 145:127638
 TITLE: Nonaqueous electrolyte solution for lithium secondary **batteries**
 INVENTOR(S): Ahn, Sun Ho; Cho, Jeong Ju; Kim, Hyeong Jin; Lee, Han Ho; Lee, Ho Chun; Lee, Jae Heon; Son, Mi Yeong
 PATENT ASSIGNEE(S): Lg Chem. Ltd., S. Korea
 SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given
 CODEN: KRXXA7
 DOCUMENT TYPE: Patent
 LANGUAGE: Korean
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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KR 2004023870	A	20040320	KR 2002-55309	20020912
PRIORITY APPLN. INFO.:				20020912

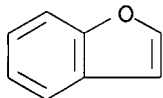
AB In this Li **battery** with a nonaq. electrolyte soln. overcharge current is blocked through polymn. of electrolyte components by degrdn. due to oxidn., thereby improving safety. The nonaq. electrolyte soln. comprises a Li salt, an electrolyte soln. compd., 0.5-5% of a nonconductive polymer monomer, and 0.1-2% of a conductive polymer monomer. Preferably the nonconductive polymer monomer is cyclohexylbenzene, isopropylbenzene or 5-butylbenzene; and the conductive polymer monomer is biphenyl, 1-phenyl-1-cyclohexane or benzofuran. The Li secondary **battery** comprises a cathode, an anode, a porous separator, and the nonaq. electrolyte soln.

IT 271-89-6, Benzofuran
 RL: DEV (Device component use); USES (Uses)

(electrolyte contg.; nonaq. electrolyte soln. for lithium secondary **batteries** with safety feature)

RN 271-89-6 HCAPLUS

CN Benzofuran (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium secondary **battery** nonaq electrolyte safety

IT Secondary **batteries**

(lithium; nonaq. electrolyte soln. for lithium secondary **batteries** with safety feature)

IT **Battery** electrolytes
Safety

(nonaq. electrolyte soln. for lithium secondary **batteries** with safety feature)

IT 92-52-4, Biphenyl, uses 98-82-8, Isopropylbenzene 135-98-8
271-89-6, Benzofuran 827-52-1

RL: DEV (Device component use); USES (Uses)

(electrolyte contg.; nonaq. electrolyte soln. for lithium secondary **batteries** with safety feature)

L123 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1005599 HCAPLUS

DOCUMENT NUMBER: 143:289485

TITLE: Secondary **battery**

INVENTOR(S): Ishii, Hariyoshi; Saruwatari, Hidesato; Hirai, Takahiro; Takami, Norio

PATENT ASSIGNEE(S): Toshiba Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005251683	A2	20050915	JP 2004-64083	20040308
PRIORITY APPLN. INFO.:				20040308
				20040308

AB The **battery** has a cathode; an anode, contg. ≥ 1 anode active mass selected from Al, Al alloys, Mg, and Mg alloys; and an electrolyte soln., contg. an org. compd. which has a porphyrin structured base-backbone, its deriv., and/or an ion of the org. compd.

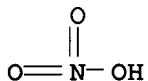
IT 7790-69-4, Lithium nitrate 10377-48-7, Lithium sulfate

RL: DEV (Device component use); USES (Uses)

(anodes contg. Al (alloys) and/or Mg (alloys) and electrolyte solns. contg. porphyrin compds. for secondary **batteries**)

RN 7790-69-4 HCAPLUS

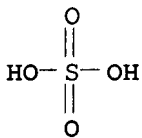
CN Nitric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 10377-48-7 HCAPLUS

CN Sulfuric acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



●2 Li

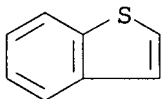
IT 95-15-8, Thio naphthene

RL: MOA (Modifier or additive use); USES (Uses)

(anodes contg. Al (alloys) and/or Mg (alloys) and electrolyte solns. contg. porphyrin compds. for secondary **batteries**)

RN 95-15-8 HCAPLUS

CN Benzo[b]thiophene (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M006-06

ICS H01M004-06; H01M004-46

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary **battery** anode aluminum magnesium alloy;

battery electrolyte porphyrin compd

IT **Battery** anodes

Battery electrolytes

Secondary **batteries**

(anodes contg. Al (alloys) and/or Mg (alloys) and electrolyte solns. contg. porphyrin compds. for secondary **batteries**)

IT 96-48-0, γ-Butyrolactone 623-53-0, Methyl ethyl carbonate

1313-13-9, Manganese dioxide, uses 7429-90-5, Aluminum, uses

7446-70-0, Aluminum chloride, uses 7447-41-8, Lithium chloride,

uses 7631-99-4, Sodium nitrate, uses 7664-93-9, Sulfuric acid,
uses 7757-79-1, Potassium nitrate, uses 7783-20-2, Ammonium
sulfate, uses 7786-30-3, Magnesium chloride, uses
7790-69-4, Lithium nitrate 10377-48-7, Lithium
sulfate 10377-60-3, Magnesium nitrate 11109-06-1 12125-02-9,
Ammonium chloride, uses 12780-46-0 37326-54-8 57921-51-4
125196-14-7 278798-61-1

RL: DEV (Device component use); USES (Uses)
(anodes contg. Al (alloys) and/or Mg (alloys) and electrolyte
solns. contg. porphyrin compds. for secondary **batteries**
)

IT 67-03-8, Thiamin hydrochloride 95-15-8, Thio naphthene
109-99-9, THF, uses 110-02-1, Thiophene 288-47-1, Thiazole
289-72-5, Thiopyran 574-93-6, Phthalocyanine 4396-11-6,
Porphyrinogen 35218-75-8D, derivs. 51094-17-8D, derivs.
60475-00-5, Thiopyran

RL: MOA (Modifier or additive use); USES (Uses)
(anodes contg. Al (alloys) and/or Mg (alloys) and electrolyte
solns. contg. porphyrin compds. for secondary **batteries**
)

L123 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:633136 HCAPLUS
DOCUMENT NUMBER: 139:152388
TITLE: Nonaqueous electrolyte compositions for lithium
secondary **batteries**
INVENTOR(S): Song, Eui-hwan; Jung, Won-il; Hwang, Duck-chul
PATENT ASSIGNEE(S): S. Korea
SOURCE: U.S. Pat. Appl. Publ., 5 pp., Cont.-in-part of
U.S. Ser. No. 565,158, abandoned.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
----- ----- US 2003152840	----- ----- A1	----- ----- 20030814	----- ----- US 2002-278354	200210 22 200005 03

PRIORITY APPLN. INFO.: US 2000-565158 B2

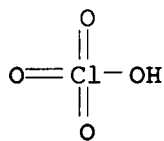
AB Disclosed are nonaq. electrolyte compns. of the present invention
that comprise nonaq. solvents and monomers such as aniline,
phenanthrene, ethylenedioxythiophene, benzothiophene or derivs.
thereof. The monomers are contained in the electrolytes of the
present invention in the amts. of less than about 5.0 wt.% of the
nonaq. solvent. In the present invention, cyclic carbonates, linear
carbonates or mixts. thereof can be used as the nonaq. solvents.
The electrolyte compns. of the present invention improve the safety
characteristics of the cell by preventing the flow of large currents
resulting from overcharge or feed-through, and also improve cell
life characteristic by helping the reversible transfer of lithium
ions.

IT 7791-03-9, Lithium perchlorate 33454-82-9, Lithium
triflate

RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte compns. for lithium secondary
batteries)

RN 7791-03-9 HCAPLUS

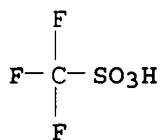
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



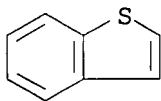
● Li

IT 95-15-8, Benzothiophene

RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte compns. for lithium secondary
batteries)

RN 95-15-8 HCAPLUS

CN Benzo[b]thiophene (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-60; H01M004-58

INCL 429338000; 429342000; 429213000; 429231400

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38

ST nonaq electrolyte compn lithium secondary **battery**; safety
 nonaq electrolyte compn lithium secondary **battery**

IT Carbonaceous materials (technological products)

RL: MOA (Modifier or additive use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(graphitized; nonaq. electrolyte compns. for lithium secondary
batteries)

- IT Secondary **batteries**
(lithium; nonaq. electrolyte compns. for lithium secondary
batteries)
- IT Pitch fibers
(mesophase; nonaq. electrolyte compns. for lithium secondary
batteries)
- IT **Battery** electrolytes
Carbonization
Conducting polymers
Graphitization
(nonaq. electrolyte compns. for lithium secondary
batteries)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
623-53-0, Ethyl methyl carbonate **7791-03-9**, Lithium
perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate 210353-06-3, Cobalt lithium
nickel strontium oxide
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte compns. for lithium secondary
batteries)
- IT 85-01-8, Phenanthrene, uses **95-15-8**, Benzothiophene
126213-51-2, Poly(Ethylenedioxythiophene)
RL: MOA (Modifier or additive use); USES (Uses)
(nonaq. electrolyte compns. for lithium secondary
batteries)

L123 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:46267 HCAPLUS

DOCUMENT NUMBER: 134:118341

TITLE: Secondary nonaqueous **electrolyte**
batteries using improved anodes and
electrolytes, and manufacture of the
batteries

INVENTOR(S): Maekawa, Yukio

PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

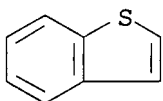
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001015172	A2	20010119	JP 1999-240599	199908 26
PRIORITY APPLN. INFO.:			JP 1999-118296	A 199904 26

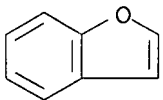
AB Secondary nonaq. **electrolyte batteries** have
cathode sheets contg. Li-contg. mixed rare earth oxides as active
materials, anode sheets contg. Li-intercalatable C materials and
having auxiliary layers bonded to Li-based metal foils, and nonaq.
electrolytes contg. **Li salts** and
additives selected from hydrazines and arom. compds. The
battery components are assembled and aged for permeation of

Li into the anodes to give the secondary **batteries**. The **batteries** have high capacity.

IT 95-15-8, Benzothiophene 271-89-6, Benzofuran
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (electrolyte solns. contg.; secondary nonaq. electrolyte **batteries** using anodes bonded to Li-contg. foils and electrolytes contg. hydrazines and/or arom. compds.)
 RN 95-15-8 HCAPLUS
 CN Benzo[b]thiophene (8CI, 9CI) (CA INDEX NAME)



RN 271-89-6 HCAPLUS
 CN Benzofuran (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); USES (Uses)
 (foil; secondary nonaq. electrolyte **batteries** using anodes bonded to Li-contg. foils and electrolytes contg. hydrazines and/or arom. compds.)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IC ICM H01M010-40
 ICS H01M010-40; H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq electrolyte **battery** anode carbon lithium; hydrazine nonaq electrolyte lithium **battery**; arom compd nonaq electrolyte lithium **battery**
 IT Carbonaceous materials (technological products)
 RL: DEV (Device component use); USES (Uses)
 (anodes; secondary nonaq. electrolyte **batteries** using anodes bonded to Li-contg. foils and electrolytes contg. hydrazines and/or arom. compds.)
 IT Heterocyclic compounds
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (arom.; secondary nonaq. electrolyte **batteries** using anodes bonded to Li-contg. foils and electrolytes contg. hydrazines and/or arom. compds.)
 IT Aromatic compounds
 RL: DEV (Device component use); MOA (Modifier or additive use); USES

- (Uses)
(heterocyclic; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT Secondary **batteries**
(lithium; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(mesophase pitch-based, anodes; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT **Battery anodes**
Battery cathodes
Battery electrolytes
(secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(anodes; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT 12190-79-3, Cobalt lithium oxide (colio2)
RL: DEV (Device component use); USES (Uses)
(cathodes; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT 95-15-8, Benzothiophene 260-94-6, Acridine
271-89-6, Benzofuran 2171-74-6, Catechol cyclic carbonate
15429-36-4
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(**electrolyte** solns. contg.; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate
RL: DEV (Device component use); USES (Uses)
(**electrolyte** solns.; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(**electrolyte**; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)
- IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(foil; secondary nonaq. **electrolyte batteries** using anodes bonded to Li-contg. foils and **electrolytes** contg. hydrazines and/or arom. compds.)

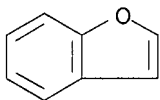
L123 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:133026 HCAPLUS

DOCUMENT NUMBER: 132:154449
 TITLE: Secondary nonaqueous electrolyte
batteries
 INVENTOR(S): Takahashi, Masatoshi; Yasutake, Zensaku; Abe,
 Hiroshi; Ueki, Akira; Takai, Tsutomu
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan; Ube Industries,
 Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000058117	A2	20000225	JP 1998-218001	199807 31
JP 2983205	B2	19991129	JP 1998-218001	199807 31

PRIORITY APPLN. INFO.: JP 1998-218001

OTHER SOURCE(S): MARPAT 132:154449
 AB The **batteries** use an electrolyte soln. contg. a **Li**
salt dissolved in an arom. ether ROR', where R = C₆H₅,
 allyl, or alkylphenyl group; R' = C₁₋₆ alkyl, Ph, allyl, or
 alkylphenyl group; and R and R' may form a C₅₋₆ ring.
 IT **271-89-6**, Benzofuran
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte solvents contg. arom. ether derivs. for secondary
 lithium **batteries**)
 RN **271-89-6** HCAPLUS
 CN Benzofuran (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery** electrolyte lithium salt arom
 ether solvent
 IT **Battery** electrolytes
 (electrolyte solvents contg. arom. ether derivs. for secondary
 lithium **batteries**)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
 14283-07-9, Lithium fluoro-borate 21324-40-3, Lithium
 hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solvents contg. arom. ether derivs. for secondary
 lithium **batteries**)
 IT 101-84-8, Diphenyl ether 271-89-6, Benzofuran 557-40-4,
 Diallyl ether 1579-40-4 3586-14-9 3739-64-8, Butyl allyl ether

RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte solvents contg. arom. ether derivs. for secondary
lithium **batteries**)

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L142 ANSWER 1 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1239360 HCAPLUS

DOCUMENT NUMBER: 144:8990

TITLE: Polymer **electrolyte** secondary lithium
batteries with long cycle life and good
stability at high temperature

INVENTOR(S): Wada, Yoshihiko; Miura, Katsuhito; Matsui,
Shohei; Tabuchi, Masato

PATENT ASSIGNEE(S): Daiso Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

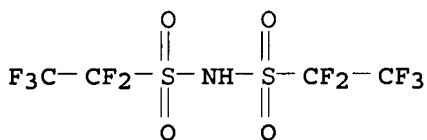
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005327566	A2	20051124	JP 2004-143916	200405 13
PRIORITY APPLN. INFO.:				200405 13

AB The **batteries** have crosslinked polymer **electrolyte**
comps. consisting of (a) multi-component copolymer polyethers with
Mw 104-107, (b) aprotic org. solvents, (c) low-mol.-wt. S compds.
and/or N compds. as additives, and (d) **Li salts**
as **electrolytes**. In the **batteries**, side
reactions between electrodes and **electrolytes** are
prevented by the additives c.

IT 132843-44-8, Lithium bis(perfluoroethylsulfonyl)imide
RL: DEV (Device component use); USES (Uses)
(**electrolytes** contg. polyoxyalkylenes; thermally stable
secondary lithium **batteries** contg. sulfur and/or
nitrogen compds. in polymer **electrolytes**)

RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-
[(pentafluoroethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)

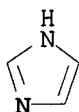


● Li

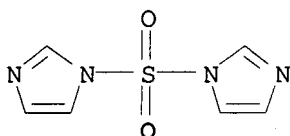
IT 7439-93-2DP, Lithium, complexes with glycidyl
(meth)acrylate-ethylene oxide copolymers
RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(**electrolytes**; thermally stable secondary lithium
batteries contg. sulfur and/or nitrogen compds. in
polymer **electrolytes**)
RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 288-32-4D, Imidazole, derivs. 7189-69-7,
1,1'-Sulfonyldiimidazole
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(thermally stable secondary lithium **batteries** contg.
sulfur and/or nitrogen compds. in polymer **electrolytes**)
RN 288-32-4 HCAPLUS
CN 1H-Imidazole (9CI) (CA INDEX NAME)



RN 7189-69-7 HCAPLUS
CN 1H-Imidazole, 1,1'-sulfonylbis- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS C08G065-321; C08K003-00; C08K005-00; C08L071-00; H01M006-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST polymer **electrolyte** lithium **battery** thermally
stable; polyoxyalkylene lithium complex **battery**
electrolyte sulfur nitrogen; secondary **battery**
polymer **electrolyte** sulfite oxazole
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(acrylic, lithium complexes, **electrolytes**; thermally
stable secondary lithium **batteries** contg. sulfur and/or
nitrogen compds. in polymer **electrolytes**)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(lithium complexes, **electrolytes**; thermally stable
secondary lithium **batteries** contg. sulfur and/or

- nitrogen compds. in polymer **electrolytes**)
- IT **Secondary batteries**
(lithium; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT Sulfonic acids, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(salts; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT Lactones
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(sultones; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT **Battery electrolytes**
Polymer electrolytes
(thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT Sulfates, uses
Sulfites
Sulfones
Sulfoxides
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT 815574-41-5DP, lithium complexes 815574-42-6DP, lithium complexes
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(crosslinked, **electrolytes**; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
108-32-7, Propylene carbonate
RL: DEV (Device component use); USES (Uses)
(**electrolyte** solvents; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT 14283-07-9, Lithium tetrafluoroborate 132843-44-8, Lithium bis(perfluoroethylsulfonyl)imide
RL: DEV (Device component use); USES (Uses)
(**electrolytes** contg. polyoxyalkylenes; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT 7439-93-2DP, Lithium, complexes with glycidyl (meth)acrylate-ethylene oxide copolymers 26282-59-7DP, lithium complexes
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(**electrolytes**; thermally stable secondary lithium **batteries** contg. sulfur and/or nitrogen compds. in polymer **electrolytes**)
- IT 120-72-9D, Indole, derivs. 288-14-2D, Isoxazole, derivs. 288-32-4D, Imidazole, derivs. 288-42-6, Oxazole 289-80-5D, Pyridazine, derivs. 289-95-2D, Pyrimidine, derivs. 290-37-9D, Pyrazine, derivs. 352-93-2, Diethyl sulfide 597-35-3, Diethyl sulfone 617-92-5, 1-Ethylpyrrole 1600-44-8,

Tetramethylene sulfoxide 1633-83-6, 1,4-Butanesultone 3741-38-6,
Glycol sulfite 7189-69-7, 1,1'-Sulfonyldiimidazole
12654-97-6D, Triazine, derivs. 74124-79-1, N,N'-Disuccinimidyl
carbonate

RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)

(thermally stable secondary lithium **batteries** contg.
sulfur and/or nitrogen compds. in polymer **electrolytes**)

L142 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:160702 HCAPLUS

DOCUMENT NUMBER: 142:243650

TITLE: **Electrolyte** composition for lithium
battery

INVENTOR(S): Roh, Kwon Sun; Choi, Jong Hyuk; Park, Chi Kyun;
Lee, Jon Ha

PATENT ASSIGNEE(S): SKC Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 5 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2005042519	A1	20050224	US 2004-920162	200408 18
CN 1612403	A	20050504	CN 2004-10092105	200408 19
PRIORITY APPLN. INFO.:		KR 2003-57276	A	200308 19

AB An **electrolyte** compn., a lithium **battery** using
the **electrolyte** compn., and a method of manufg. the
lithium **battery** are provided. The **electrolyte**
compn. includes: a lithium salt, and an org.
solvent contg. a nitrogen-contg. compd., propane sultone, and
vinylene carbonate and/or cyclohexylbenzene. The
electrolyte compn. ensures a **battery** safety when
operated at high temp. without performance degrdn.

IT 7439-93-2D, Lithium, salt

7791-03-9, Lithium perchlorate 33454-82-9, Lithium
triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)

(**electrolyte** compn. for lithium **battery**)

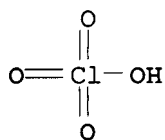
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

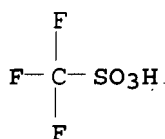
RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



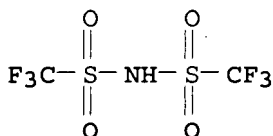
● Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

IT 288-47-1, Thiazole
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte compn. for lithium battery)
 RN 288-47-1 HCAPLUS
 CN Thiazole (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M010-04
 INCL 429330000; 429326000; 429314000; 029623200
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

- ST **electrolyte** compn lithium **battery**; safety
electrolyte compn lithium **battery**
- IT Heterocyclic compounds
RL: MOA (Modifier or additive use); USES (Uses)
(arom.; **electrolyte** compn. for lithium **battery**)
- IT **Battery electrolytes**
Safety
(**electrolyte** compn. for lithium **battery**)
- IT Epoxides
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** compn. for lithium **battery**)
- IT Aromatic compounds
RL: MOA (Modifier or additive use); USES (Uses)
(heterocyclic; **electrolyte** compn. for lithium **battery**)
- IT Secondary **batteries**
(lithium; **electrolyte** compn. for lithium **battery**)
- IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polymers; **electrolyte** compn. for lithium **battery**)
- IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
(primary; **electrolyte** compn. for lithium **battery**)
- IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
(secondary; **electrolyte** compn. for lithium **battery**)
- IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
(tertiary; **electrolyte** compn. for lithium **battery**)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 7439-93-2D, Lithium
, salt 7440-44-0, Carbon, uses 7791-03-9,
Lithium perchlorate 9002-88-4, Polyethylene 9003-07-0,
Polypropylene 12190-79-3, Cobalt lithium oxide (CoLiO₂)
14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium
hexafluoro antimonate 21324-40-3, Lithium hexafluorophosphate
29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium
triflate 90076-65-6
RL: DEV (Device component use); USES (Uses)
(**electrolyte** compn. for lithium **battery**)
- IT 110-86-1, Pyridine, uses 288-47-1, Thiazole 289-06-5,
Thiadiazole 289-80-5, Pyridazine 289-95-2, Pyrimidine
290-37-9, Pyrazine 827-52-1, Cyclohexylbenzene 872-36-6,
Vinylene carbonate 1120-71-4, Propane sultone 2425-79-8,
1,4-Butanediol diglycidyl ether 12654-97-6, Triazine 24980-54-9,
Styrene-2-vinylpyridine copolymer 37306-44-8, Triazole
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** compn. for lithium **battery**)

L142 ANSWER 3 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:904490 HCAPLUS

DOCUMENT NUMBER: 141:359083

TITLE: Polymer solid **electrolytes** with high
ion conductivity

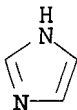
INVENTOR(S): Matsuyama, Mutsuhiro; Watanabe, Takeshi
PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2004303492	A2	20041028	JP 2003-92927	200303 28
PRIORITY APPLN. INFO.: JP 2003-92927				200303 28

AB The **electrolytes** contain imidazolium salts contg.
≥2 polymerizable groups or their derivs. The
electrolytes may contain homopolymers of the above compds.
or their copolymers with other monomers. Preferably, the
electrolytes contain alkali metal salts. The
electrolytes have high flexibility, mech. strength, storage
stability, leak resistance, etc., and are suitable for
batteries, capacitors, solar cells, gel actuators, etc.

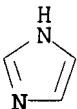
IT 288-32-4DP, Imidazole, Bis(styrylmethyl) quaternary ammonium
chlorides and bis(trifluoromethanesulfone)imides, polymer derivs.
RL: IMF (Industrial manufacture); RCT (Reactant); PREP
(Preparation); RACT (Reactant or reagent)
(monomer from; polymerizable imidazolium salt-based polymer solid
electrolytes with high ion cond.)

RN 288-32-4 HCAPLUS
CN 1H-Imidazole (9CI) (CA INDEX NAME)



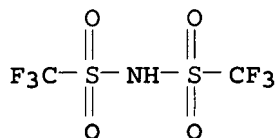
IT 288-32-4, Imidazole, reactions 90076-65-6, Lithium
bis(trifluoromethanesulfonyl)imide
RL: RCT (Reactant); RACT (Reactant or reagent)
(monomer from; polymerizable imidazolium salt-based polymer solid
electrolytes with high ion cond.)

RN 288-32-4 HCAPLUS
CN 1H-Imidazole (9CI) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,

lithium salt (9CI) (CA INDEX NAME)



● Li

- IT 7439-93-2DP, Lithium, acrylic imidazolium polymer complex
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polymerizable imidazolium salt-based polymer solid electrolytes with high ion cond.)
- RN 7439-93-2 HCAPLUS
- CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)
- Li
- IC ICM H01B001-06
 ICS C08G061-12; H01M010-40
- CC 76-2 (Electric Phenomena)
 Section cross-reference(s): 38
- ST polymer solid electrolyte imidazolium polymerizable group;
 ion cond polymerizable imidazolium salt polymer electrolyte
- IT Polymer electrolytes
 (polymerizable imidazolium salt-based polymer solid electrolytes with high ion cond.)
- IT 288-32-4DP, Imidazole, Bis(styrylmethyl) quaternary ammonium chlorides and bis(trifluoromethanesulfone)imides, polymer derivs.
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (monomer from; polymerizable imidazolium salt-based polymer solid electrolytes with high ion cond.)
- IT 288-32-4, Imidazole, reactions 1592-20-7,
 p-Chloromethylstyrene 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (monomer from; polymerizable imidazolium salt-based polymer solid electrolytes with high ion cond.)
- IT 97-90-5DP, Ethylene glycol dimethacrylate, polymer derivs. with acryloylmorpholine, acryloyloxypropyltrimethylammonium bis(trifluoromethanesulfonyl)imide, and bis(styrylmethyl)imidazolium bis(trifluoromethanesulfone)imide, lithium complexes 5117-12-4DP, Acryloylmorpholine, polymer derivs. with acryloyloxypropyltrimethylammonium bis(trifluoromethanesulfone)imide, bis(styrylmethyl)imidazolium bis(trifluoromethanesulfone)imide, and ethylene glycol dimethacrylate, lithium complexes 7439-93-2DP, Lithium, acrylic imidazolium polymer complex 676578-35-1DP, polymer derivs. with acryloylmorpholine, bis(styrylmethyl)imidazolium bis(trifluoromethanesulfone)imide, and ethylene glycol dimethacrylate, lithium complexes
 RL: IMF (Industrial manufacture); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)
 (polymerizable imidazolium salt-based polymer solid
electrolytes with high ion cond.)

L142 ANSWER 4 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:392771 HCAPLUS

DOCUMENT NUMBER: 140:378118

TITLE: **Electrolyte** composition for lithium
 secondary **battery** having high
 overcharge-safety

INVENTOR(S): Roh, Kwonsun; Choi, Jonghyuk; Lee, Jaemyoung;
 Lee, Jonha

PATENT ASSIGNEE(S): SKC Limited, S. Korea

SOURCE: PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004040687	A1	20040513	WO 2003-KR2274	200310 27
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2004037534	A	20040507	KR 2002-66067	200210 29
AU 2003272137	A1	20040525	AU 2003-272137	200310 27
PRIORITY APPLN. INFO.:				200210 29
KR 2002-66067				A
WO 2003-KR2274				W
				200310 27

AB An **electrolyte** compn. comprising a nitrogen-contg. compd.,
 cyclohexyl benzene, an org. solvent and a **lithium**
salt is advantageously used for the prepn. of a lithium
 secondary **battery** having high overcharge-safety, cycling
 life and high-temp. swelling properties at the same time.

IT 288-47-1, Thiazole 7439-93-2D, **Lithium**,
salt 7791-03-9, Lithium perchlorate
 33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)
 (electrolyte compn. for lithium secondary
 battery having high overcharge-safety)

RN 288-47-1 HCAPLUS

CN Thiazole (6CI, 8CI, 9CI) (CA INDEX NAME)



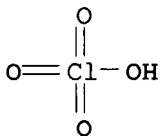
RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7791-03-9 HCAPLUS

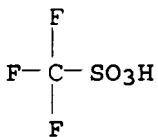
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 33454-82-9 HCAPLUS

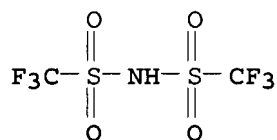
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

- IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **electrolyte** compn lithium secondary **battery** high overcharge safety
 IT **Battery electrolytes**
 Safety
 (**electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT Polymers, uses
 RL: DEV (Device component use); USES (Uses)
 (**electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT Epoxy resins, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT Secondary **batteries**
 (lithium; **electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT Heterocyclic compounds
 RL: DEV (Device component use); USES (Uses)
 (nitrogen; **electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT Amines, uses
 RL: DEV (Device component use); USES (Uses)
 (tertiary; **electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 110-86-1, Pyridine, uses 121-44-8, Triethylamine, uses
 288-47-1, Thiazole 289-06-5, Thiadiazole 289-80-5,
 Pyridazine 289-95-2, Pyrimidine 290-37-9D, Pyrazine, salt
 616-38-6, Dimethyl carbonate 827-52-1, Cyclohexylbenzene
 2425-79-8, 1,4-Butanediol diglycidyl ether **7439-93-2D**,
Lithium, salt 7727-37-9D, Nitrogen, compd.
 7791-03-9, Lithium perchlorate 9003-47-8,
 Polyvinylpyridine 9019-70-9, Styrene-vinylpyridine copolymer
 12190-79-3, Cobalt lithium oxide colio2 12654-97-6, Triazine
 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium
 hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate
 29935-35-1, Lithium hexafluoroarsenate **33454-82-9**, Lithium
 triflate 37306-44-8, Triazole **90076-65-6**
 RL: DEV (Device component use); USES (Uses)
 (**electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)
 IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (mesocarbon microbeads; **electrolyte** compn. for lithium secondary **battery** having high overcharge-safety)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L142 ANSWER 5 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:41827 HCAPLUS
DOCUMENT NUMBER: 140:79851
TITLE: **Electrolyte** composition for lithium
secondary **battery** having high
overcharge-safety
INVENTOR(S): Park, Chi-Kyun; Zhang, Zhiwei; Chai, Chul; Lee,
Jonha; Roh, Kwonsun
PATENT ASSIGNEE(S): SKC Limited, S. Korea
SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004006378	A1	20040115	WO 2003-KR1332	200307 07
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2004006057	A	20040124	KR 2002-39570	200207 09
AU 2003281410	A1	20040123	AU 2003-281410	200307 07
PRIORITY APPLN. INFO.:				200207 09
KR 2002-39570				A
WO 2003-KR1332				W
				200307 07

AB An **electrolyte** compn. comprising a nitrogen-contg. compd.,
biphenyl, an org. solvent and a **lithium salt** is
advantageously used for the prepn. of a lithium secondary
battery having high overcharge-safety, cycling life and
capacity properties.

IT 288-47-1, Thiazole 7439-93-2D, Lithium,
salt 7791-03-9, Lithium perchlorate
33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)
 (electrolyte compn. for lithium secondary
 battery having high overcharge-safety)

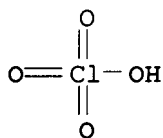
RN 288-47-1 HCAPLUS
 CN Thiazole (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

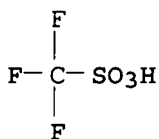
Li

RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



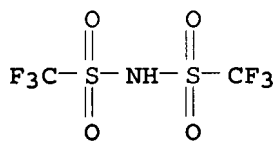
● Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)

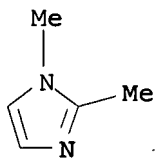


● Li

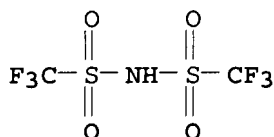
- IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **electrolyte** compn lithium secondary **battery** high
 overcharge safety
 IT **Battery electrolytes**
 Safety
 (electrolyte compn. for lithium secondary
battery having high overcharge-safety)
 IT Epoxides
 Halogen compounds
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte compn. for lithium secondary
battery having high overcharge-safety)
 IT Secondary **batteries**
 (lithium; **electrolyte** compn. for lithium secondary
battery having high overcharge-safety)
 IT Heterocyclic compounds
 RL: DEV (Device component use); USES (Uses)
 (nitrogen, arom.; **electrolyte** compn. for lithium
 secondary **battery** having high overcharge-safety)
 IT Heterocyclic compounds
 RL: DEV (Device component use); USES (Uses)
 (polymers, nitrogen-contg., arom.; **electrolyte** compn.
 for lithium secondary **battery** having high
 overcharge-safety)
 IT Amines, uses
 RL: DEV (Device component use); USES (Uses)
 (tertiary; **electrolyte** compn. for lithium secondary
battery having high overcharge-safety)
 IT 92-52-4, Biphenyl, uses 96-49-1, Ethylene carbonate 105-58-8,
 Diethyl carbonate 110-86-1, Pyridine, uses 121-44-8,
 Triethylamine, uses 288-47-1, Thiazole 289-06-5,
 Thiadiazole 289-80-5, Pyridazine 289-95-2, Pyrimidine
 290-37-9, Pyrazine 616-38-6, Dimethyl carbonate 7439-93-2D
 , Lithium, salt 7791-03-9, Lithium
 perchlorate 9003-47-8, Polyvinylpyridine 9019-70-9,
 Styrene-vinylpyridine copolymer 12190-79-3, Cobalt lithium oxide
 colio2 12654-97-6, Triazine 14283-07-9, Lithium
 tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate
 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium
 hexafluoroarsenate 33454-82-9, Lithium triflate
 37306-44-8, Triazole 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (electrolyte compn. for lithium secondary
battery having high overcharge-safety)
 IT 2386-87-0, 3,4-Epoxy cyclohexylmethyl-3',4'-epoxycyclohexane
 carboxylate
 RL: MOA (Modifier or additive use); USES (Uses)

(**electrolyte** compn. for lithium secondary
battery having high overcharge-safety)
IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(mesocarbon microbeads; **electrolyte** compn. for lithium
secondary **battery** having high overcharge-safety)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L142 ANSWER 6 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:830910 HCAPLUS
DOCUMENT NUMBER: 140:62227
TITLE: The use of ionic liquids in polymer gel
electrolytes
AUTHOR(S): De Long, Hugh C.; Trulove, Paul C.; Sutto,
Thomas E.
CORPORATE SOURCE: Air Force Office of Scientific Research,
Arlington, VA, 22203-1977, USA
SOURCE: ACS Symposium Series (2003), 856(Ionic Liquids
as Green Solvents), 478-494
CODEN: ACSMC8; ISSN: 0097-6156
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Polymer gel **electrolytes** composed of 1,2-dimethyl-3-n-
alkyl-imidazolium bis-trifluoromethanesulfonylimide (alkyl = Pr or
butyl) and polyvinylidenedifluoro-hexafluoropropylene are
characterized by ac-impedance and cyclic voltammetry. Two electrode
charge-discharge expts. were also performed using graphitic paper or
Li metal as the anode, and polymer composites of LiMn2O4, LiCoO2, or
V2O5 as cathodes. Results indicated that the polymer composite gel
electrolytes were stable for over 50 cycles when used in
direct contact with Li metal. High efficiencies and low voltage
drop-offs indicate that polymer gel composite electrodes composed of
these ionic liqs. are a viable alternative to the more common org.
solvent **electrolytes**.
IT 1739-84-0, 1,2-Dimethylimidazole 90076-65-6,
Lithium bistrifluoromethanesulfonylimide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PROC (Process)
(ionic liqs. in polymer gel **battery**
electrolytes)
RN 1739-84-0 HCAPLUS
CN 1H-Imidazole, 1,2-dimethyl- (9CI) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
lithium salt (9CI) (CA INDEX NAME)



● Li

- IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (ionic liqs. in polymer gel **battery electrolytes**)
- RN 7439-93-2 HCAPLUS
- CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)
- Li
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
- ST ionic liq polymer gel **battery electrolyte**
- IT Polymers, uses
 RL: DEV (Device component use); NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (gels; ionic liqs. in polymer gel **battery electrolytes**)
- IT **Battery electrolytes**
 Cyclic voltammetry
 Ionic conductivity
 Ionic liquids
 Solid **electrolytes**
 (ionic liqs. in polymer gel **battery electrolytes**)
- IT **Secondary batteries**
 (lithium; ionic liqs. in polymer gel **battery electrolytes**)
- IT Salts, uses
 RL: DEV (Device component use); NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (org., molten; ionic liqs. in polymer gel **battery electrolytes**)
- IT 108-10-1, 4-Methyl-2-pentanone 109-69-3, 1-Chlorobutane
 540-54-5, 1-Chloropropane 1739-84-0, 1,2-Dimethylimidazole
 16941-11-0, Ammonium hexafluorophosphate 90076-65-6,
 Lithium bistrifluoromethanesulfonylimide
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (ionic liqs. in polymer gel **battery electrolytes**)
- IT 1314-62-1, Vanadium oxide V2O5, uses 7439-93-2, Lithium,
 uses 9011-17-0 12057-17-9, Lithium manganese oxide LiMn2O4
 12190-79-3, Lithium cobalt oxide LiCoO2 169051-76-7 350493-08-2
 RL: DEV (Device component use); NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (ionic liqs. in polymer gel **battery**)

electrolytes)

IT 7782-42-5, Graphite, uses
 RL: DEV (Device component use); NUU (Other use, unclassified); TEM
 (Technical or engineered material use); USES (Uses)
 (paper; ionic liqs. in polymer gel **battery**
electrolytes)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

L142 ANSWER 7 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 2000:665699 HCAPLUS
 DOCUMENT NUMBER: 133:254952
 TITLE: Polymer **electrolyte** for lithium
 secondary **batteries**
 INVENTOR(S): Oyama, Noboru
 PATENT ASSIGNEE(S): Japan
 SOURCE: Eur. Pat. Appl., 32 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1037294	A2	20000920	EP 2000-105773	200003 17
EP 1037294	A3	20030730		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001189166	A2	20010710	JP 2000-70790	200003 14
CA 2301414	AA	20000917	CA 2000-2301414	200003 16
US 6509122	B1	20030121	US 2000-527569	200003 16
CN 1267683	A	20000927	CN 2000-104319	200003 17
AU 770639	B2	20040226	AU 2000-22331	200003 17
US 2003082458	A1	20030501	US 2002-227532	200208 26
PRIORITY APPLN. INFO.:			JP 1999-71758	A 199903 17
			JP 1999-295503	A 199910 18
			US 2000-527569	A3

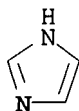
200003

16

AB A polymer **electrolyte** providing lithium secondary **batteries** in which growth of lithium dendrites is suppressed and **batteries** exhibiting excellent discharge characteristics in low to high temp., comprises a polymer gel holding a nonaq. solvent contg. an **electrolyte**. The polymer gel comprises (I) a unit derived from at least one monomer having one copolymerizable vinyl group and (II) a unit derived from at least one compd. selected from the group consisting of (II-a) a compd. having two acryloyl groups and a (poly)oxyethylene group, (II-b) a compd. having one acryloyl group and a (poly)oxyethylene group, and (II-c) a glycidyl ether compd., particularly the polymer gel comprises monomer (I), compd. (II-a), and a copolymerizable plasticizing compd.

IT 288-32-4D, Imidazole, alkyl deriv. 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate 90076-65-6 131651-65-5
 RL: DEV (Device component use); USES (Uses)
 (polymer **electrolyte** for lithium secondary **batteries**)

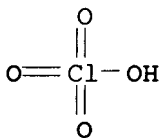
RN 288-32-4 HCAPLUS
 CN 1H-Imidazole (9CI) (CA INDEX NAME)



RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

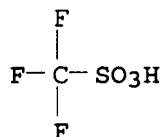
Li

RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



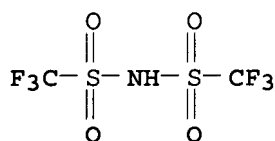
● Li

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



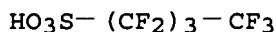
● Li

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
 lithium salt (9CI) (CA INDEX NAME)



● Li

RN 131651-65-5 HCAPLUS
 CN 1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, lithium salt
 (9CI) (CA INDEX NAME)



● Li

IC ICM H01M006-18
 ICS C08L071-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38, 76
 ST lithium **battery** polymer **electrolyte**
 IT Pyridinium compounds
 RL: DEV (Device component use); USES (Uses)
 (alkyl; polymer **electrolyte** for lithium secondary
batteries)
 IT Secondary **batteries**
 (lithium; polymer **electrolyte** for lithium secondary
batteries)
 IT **Battery electrolytes**
 Capacitors
 Polymer **electrolytes**
 (polymer **electrolyte** for lithium secondary
batteries)
 IT Amides, uses
 Lactones
 Nitriles, uses
 Polyanilines

RL: DEV (Device component use); USES (Uses)
(polymer **electrolyte** for lithium secondary
batteries)

IT Phosphonium compounds

Quaternary ammonium compounds, uses

RL: DEV (Device component use); USES (Uses)

(tetraalkyl; polymer **electrolyte** for lithium secondary
batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
108-32-7, Propylene carbonate **288-32-4D**, Imidazole, alkyl
deriv. 1072-71-5, 2,5-Dimercapto-1,3,4-thiadiazole
7439-93-2, Lithium, uses **7791-03-9**, Lithium
perchlorate 9063-88-1, Blemmer PDE 400-methyl methacrylate
copolymer 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
Lithium hexafluorophosphate 25101-19-3, Methylmethacrylate-
triethylene glycol dimethacrylate copolymer 25233-30-1,
Polyaniline 25777-71-3, Blemmer PDE 50-methyl methacrylate
copolymer 27308-26-5, Blemmer PDE 100-methyl methacrylate
copolymer 29403-27-8 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate 35895-69-3,
Tetraethylammonium trifluoromethanesulfonate 59049-11-5, Blemmer
PME 150-methyl methacrylate copolymer 72892-39-8, Blemmer PE
200-methyl methacrylate copolymer 81381-02-4, Acrylonitrile-
triethylene glycol dimethacrylate copolymer **90076-65-6**
114388-54-4, Cyclohexyl methacrylate-methyl methacrylate-triethylene
glycol dimethacrylate copolymer 129283-05-2 130425-25-1, Blemmer
PME 100-methyl methacrylate copolymer **131651-65-5**
132404-42-3 144442-23-9 294189-08-5 294189-09-6, Methyl
methacrylate-2-methacryloyloxyethyl phthalate-triethylene glycol
dimethacrylate copolymer 294189-10-9, Benzyl methacrylate-methyl
methacrylate-triethylene glycol dimethacrylate copolymer
294189-11-0, Isobornyl methacrylate-methyl methacrylate-triethylene
glycol dimethacrylate copolymer 294189-12-1 294189-13-2
294189-14-3, 2-Diethylaminoethyl methacrylate-methyl
methacrylate-triethylene glycol dimethacrylate copolymer
294189-15-4, Methyl methacrylate-triethylene glycol
dimethacrylate-trifluoroethyl methacrylate copolymer 294189-16-5,
Diethylene glycol monomethacrylate-methyl methacrylate-triethylene
glycol dimethacrylate copolymer 294189-17-6, Methoxyethyleneglycol
methacrylate-methyl methacrylate-triethylene glycol dimethacrylate
copolymer 294189-18-7 294189-20-1

RL: DEV (Device component use); USES (Uses)
(polymer **electrolyte** for lithium secondary
batteries)

IT 78-67-1, AIBN

RL: TEM (Technical or engineered material use); USES (Uses)
(polymn. initiator; polymer **electrolyte** for lithium
secondary **batteries**)

L142 ANSWER 8 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:808567 HCAPLUS

DOCUMENT NUMBER: 132:24879

TITLE: Solid polymer **electrolyte** rechargeable
batteries containing a redox shuttle
additive for overcharge protection

INVENTOR(S): Richardson, Thomas J.; Ross, Philip N.

PATENT ASSIGNEE(S): United States Dept. of Energy, USA

SOURCE: U.S., 7 pp.
CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

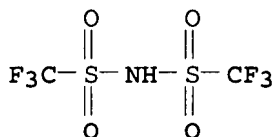
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6004698	A	19991221	US 1997-915612	19970821
PRIORITY APPLN. INFO.:				19970821

AB A class of org. redox shuttle additives is described, preferably comprising nitrogen-contg. aroms. compds., which can be used in a high temp. (85° or higher) **battery** comprising a cathode, an anode, and a solid polymer **electrolyte** to provide overcharge protection to the cell. The org. redox additives or shuttles are characterized by a high diffusion coeff. of at least 2.1×10^{-8} cm²/s and a high onset potential of 2.5 V or higher. Examples of such org. redox shuttle additives include an alkali metal salt of 1,2,4-triazole, an alkali metal salt of imidazole, 2,3,5,6-tetramethylpyrazine, 1,3,5-tricyanobenzene, and a dialkali metal salt of 3-4-dihydroxy-3-cyclobutene-1,2-dione.

IT 7439-93-2, Lithium, uses 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (solid polymer **electrolyte** rechargeable
batteries contg. redox shuttle additive for overcharge protection)
 RN 7439-93-2 HCAPLUS
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

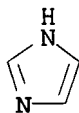
Li

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

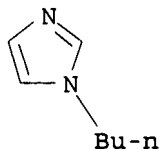
IT 288-32-4D, Imidazole, alkali metal salt
 RL: MOA (Modifier or additive use); USES (Uses)
 (solid polymer **electrolyte** rechargeable
batteries contg. redox shuttle additive for overcharge protection)
 RN 288-32-4 HCAPLUS
 CN 1H-Imidazole (9CI) (CA INDEX NAME)



IC ICM H01M006-18
 INCL 429305000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery** redox shuttle additive overcharge protection
 IT Polyoxyalkylenes, uses
 RL: DEV (Device component use); USES (Uses)
 (lithium complex, trifluoromethane sulfonimide contg.; solid
 polymer **electrolyte** rechargeable **batteries**
 contg. redox shuttle additive for overcharge protection)
 IT Secondary **batteries**
 (lithium; solid polymer **electrolyte** rechargeable
batteries contg. redox shuttle additive for overcharge
 protection)
 IT Secondary **batteries**
 (solid polymer **electrolyte** rechargeable
batteries contg. redox shuttle additive for overcharge
 protection)
 IT 7439-93-2, Lithium, uses 90076-65-6 127575-11-5,
 Lithium manganese oxide li2mn4o9
 RL: DEV (Device component use); USES (Uses)
 (solid polymer **electrolyte** rechargeable
batteries contg. redox shuttle additive for overcharge
 protection)
 IT 288-32-4D, Imidazole, alkali metal salt 288-88-0D,
 1H-1,2,4-Triazole, alkali metal salt 1124-11-4 1518-16-7, Tcnq
 2892-51-5D, dialkali metal salt 5587-42-8, Sodium imidazole
 7440-44-0, Carbon, uses 10365-94-3, 1,3,5-Tricyanobenzene
 41253-21-8, Sodium 1,2,4-Triazole
 RL: MOA (Modifier or additive use); USES (Uses)
 (solid polymer **electrolyte** rechargeable
batteries contg. redox shuttle additive for overcharge
 protection)
 IT 25322-68-3D, Peo, lithium complex
 RL: DEV (Device component use); USES (Uses)
 (trifluoromethane sulfonimide contg.; solid polymer
electrolyte rechargeable **batteries** contg. redox
 shuttle additive for overcharge protection)
 REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT
 L142 ANSWER 9 OF 9 HCAPLUS COPYRIGHT 2006 ACS on STN
 ACCESSION NUMBER: 1992:135528 HCAPLUS
 DOCUMENT NUMBER: 116:135528
 TITLE: Performance-oriented packaging standards;
 changes to classification, hazard communication,
 packaging and handling requirements based on UN
 standards and agency initiative
 CORPORATE SOURCE: United States Dept. of Transportation,
 Washington, DC, 20590-0001, USA
 SOURCE: Federal Register (1990), 55(246), 52402-729, 21
 Dec 1990

CODEN: FEREAC; ISSN: 0097-6326
DOCUMENT TYPE: Journal
LANGUAGE: English

- AB The hazardous materials regulations under the Federal Hazardous Materials Transportation Act are revised based on the United Nations recommendations on the transport of dangerous goods. The regulations cover the classification of materials, packaging requirements, and package marking, labeling, and shipping documentation, as well as transportation modes and handling, and incident reporting. Performance-oriented stds. are adopted for packaging for bulk and nonbulk transportation, and SI units of measurement generally replace US customary units. Hazardous material descriptions and proper shipping names are tabulated together with hazard class, identification nos., packing group, label required, special provisions, packaging authorizations, quantity limitations, and vessel stowage requirements.
- IT 4316-42-1, N-n-Butylimidazole 7439-93-2, Lithium, miscellaneous 7439-93-2D, Lithium, alkyl derivs. 7790-69-4, Lithium nitrate 13840-33-0, Lithium hypochlorite 13840-33-0D, Lithium hypochlorite, mixts. RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(packaging and transport of, stds. for)
- RN 4316-42-1 HCAPLUS
CN 1H-Imidazole, 1-butyl- (9CI) (CA INDEX NAME)



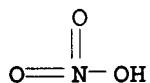
- RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

- RN 7439-93-2 HCAPLUS
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

- RN 7790-69-4 HCAPLUS
CN Nitric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 13840-33-0 HCAPLUS
CN Hypochlorous acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

Cl-OH

● Li

RN 13840-33-0 HCAPLUS
CN Hypochlorous acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

Cl-OH

● Li

CC 59-6 (Air Pollution and Industrial Hygiene)
IT Adhesives
Alcoholic beverages
Ammunition
Antifreeze substances
Bactericides, Disinfectants, and Antiseptics
Batteries, primary
Blasting gelatin
Bombs (explosives)
Carbon paper
Cartridges
Castor bean
Coating materials
Corrosive substances
Cotton
Creosote
Detonators
Dyes
Dynamite
Electric fuses
Exothermic materials
Explosives
Flavoring materials
Flue dust
Fuel cells
Fuel oil
Fuels, diesel
Fuels, jet aircraft

Fusel oil
 Fuses, explosives
 Gas oils
 Hay
 Herbicides
 Igniters and Lighters
 Insecticides
 Lacrimators
 Magnetic substances
 Matches
 Oxidizing agents
 Perfumes
 Pesticides
 Petroleum products
 Pharmaceuticals
 Photoelectric devices
 Poisons
 Primers, explosive
 Projectiles
 Pyrophoric substances
 Pyrotechnic compositions
 Radioactive substances
 Refrigerating apparatus
 Rockets
 Shale oils
 Solvent naphtha
 Sprays
 Straw
 Textiles
 Thermoelectric devices
 Torpedoes (weapons)
 Turpentine
 Wood preservatives

(packaging and transport of, stds. for)
 IT 1002-16-0, Amyl nitrate 1070-19-5, tert-Butoxycarbonyl azide
 1120-21-4, Undecane 1125-27-5 1126-78-9 1187-93-5,
 Perfluoromethyl vinyl ether 1299-86-1, Aluminum carbide
 1300-64-7, Anisoyl chloride 1300-71-6, Xylenol 1300-73-8D,
 derivs. 1303-28-2, Arsenic pentoxide 1303-33-9, Arsenic sulfide
 1303-33-9D, Arsenic sulfide, mixt. with chlorates 1304-28-5,
 Barium oxide, miscellaneous 1304-29-6, Barium peroxide
 1305-78-8, Calcium oxide, miscellaneous 1305-79-9, Calcium
 peroxide 1305-99-3, Calcium phosphide 1309-60-0, Lead dioxide
 1310-58-3, Potassium hydroxide, miscellaneous 1310-65-2, Lithium
 hydroxide 1310-73-2, Sodium hydroxide, miscellaneous 1310-82-3,
 Rubidium hydroxide 1312-73-8, Potassium sulfide 1313-60-6,
 Sodium peroxide 1313-82-2, Sodium sulfide, miscellaneous
 1314-18-7, Strontium peroxide 1314-22-3, Zinc peroxide
 1314-24-5, Phosphorus trioxide 1314-34-7, Vanadium trioxide
 1314-56-3, Phosphorus pentoxide, miscellaneous 1314-62-1, Vanadium
 pentoxide, miscellaneous 1314-80-3, Phosphorus sulfide (P2S5)
 1314-84-7, Zinc phosphide 1314-85-8, Phosphorus sesquisulfide
 1319-77-3, Cresylic acid 1320-37-2, Dichlorotetrafluoroethane
 1321-10-4, Chlorocresol 1321-31-9, Phenetidine 1327-53-3,
 Arsenic trioxide 1330-20-7, Xylene, miscellaneous 1330-45-6,
 Chlorotrifluoroethane 1330-78-5, Tricresyl phosphate 1331-22-2,
 Methyl cyclohexanone 1332-12-3, Fulminating gold 1332-37-2, Iron
 oxide, properties 1333-39-7, Phenolsulfonic acid 1333-41-1,
 Picoline 1333-74-0, Hydrogen, miscellaneous 1333-82-0, Chromium
 trioxide 1333-83-1, Sodium hydrogen fluoride 1335-26-8,

Magnesium peroxide 1335-31-5, Mercury oxycyanide 1335-85-9,
Dinitro-o-cresol 1336-21-6, Ammonium hydroxide 1337-81-1
1338-23-4, Methyl ethyl ketone peroxide 1341-24-8,
Chloroacetophenone 1341-49-7, Ammonium hydrogen fluoride
1344-40-7, Lead phosphite, dibasic 1344-67-8, Copper chloride
1498-40-4, Ethyl phosphonous dichloride 1498-51-7, Ethyl
phosphorodichloridate 1569-69-3, Cyclohexyl mercaptan 1609-86-5,
tert-Butyl isocyanate 1623-15-0 1623-24-1, Isopropyl acid
phosphate 1634-04-4, Methyl-tert-butyl ether 1693-71-6, Triallyl
borate 1705-60-8, 2,2-Di(4,4-di-tert-butylperoxycyclohexyl)propane
1712-64-7, Isopropyl nitrate 1719-53-5, Diethyldichlorosilane
1737-93-5, 3,5-Dichloro-2,4,6-trifluoropyridine 1789-58-8,
Ethyldichlorosilane 1795-48-8, Isopropyl isocyanate 1838-59-1,
Allyl formate 1873-29-6, Isobutyl isocyanate 1885-14-9,
Phenylchloroformate 1947-27-9, Arsenic trichloride 2050-92-2,
Di-n-amylamine 2094-98-6, 1,1'-Azodi(hexahydrobenzonitrile)
2144-45-8, Dibenzyl peroxydicarbonate 2155-71-7 2167-23-9,
2,2-Di(tert-butylperoxy)butane 2217-06-3, Dipicryl sulfide
2243-94-9, 1,3,5-Trinitronaphthalene 2244-21-5, Potassium
dichloroisocyanurate 2294-47-5, p-Diazidobenzene 2312-76-7
2338-12-7, 5-Nitrobenzotriazole 2487-90-3, Trimethoxysilane
2508-19-2, Trinitrobenzenesulfonic acid 2524-03-0, Dimethyl
chlorothiophosphate 2524-04-1, Diethylthiophosphoryl chloride
2549-51-1, Vinyl chloroacetate 2551-62-4, Sulfur hexafluoride
2567-83-1, Tetraethylammonium perchlorate 2657-00-3, Sodium
2-diazo-1-naphthol-5-sulfonate 2691-41-0,
Cyclotetramethylenetetranitramine 2696-92-6, Nitrosyl chloride
2699-79-8, Sulfuryl fluoride 2782-57-2, Dichloroisocyanuric acid
2782-57-2D, Dichloroisocyanuric acid, salts 2820-51-1, Nicotine
hydrochloride 2825-15-2 2855-13-2, Isophoronediamine
2867-47-2, Dimethylaminoethyl methacrylate 2893-78-9, Sodium
dichloroisocyanurate 2937-50-0, Allyl chloroformate 2941-64-2,
Ethyl chlorothioformate 2980-64-5 3025-88-5,
2,5-Dimethyl-2,5-dihydroperoxy hexane 3031-74-1, Ethyl
hydroperoxide 3032-55-1 3054-95-3, 3,3-Diethoxypropene
3087-37-4, Tetrapropylorthotitanate 3129-90-6, Isothiocyanic acid
3129-91-7, Dicyclohexylammonium nitrite 3132-64-7, Epibromohydrin
3165-93-3, 4-Chloro-o-toluidine hydrochloride 3173-53-3,
Cyclohexyl isocyanate 3179-56-4, Acetyl cyclohexanesulfonyl
peroxide 3188-13-4, Chloromethyl ethyl ether 3248-28-0,
Dipropionyl peroxide 3268-49-3 3275-73-8, Nicotine tartrate
3282-30-2, Trimethylacetyl chloride 3497-00-5, Phenyl phosphorus
thiodichloride 3689-24-5 3724-65-0, Crotonic acid 3811-04-9,
Potassium chlorate 3926-62-3, Sodium chloroacetate 3982-91-0,
Thiophosphoryl chloride 4016-11-9, 1,2-Epoxy-3-ethoxypropane
4098-71-9 4109-96-0, Dichlorosilane 4170-30-3, Crotonaldehyde
4300-97-4 4316-42-1, N-n-Butylimidazole 4419-11-8,
2,2'-Azodi(2,4-dimethylvaleronitrile) 4421-50-5 4435-53-4,
Butoxyl 4452-58-8, Sodium percarbonate 4472-06-4,
Carbonazidodithioic acid 4484-72-4, Dodecyltrichlorosilane
4528-34-1 4547-70-0 4591-46-2 4682-03-5, Diazodinitrophenol
4795-29-3, Tetrahydrofurfurylamine 4904-61-4, 1,5,9-
Cyclododecatriene 5283-66-9, Octyltrichlorosilane 5283-67-0,
Nonyltrichlorosilane 5329-14-6, Sulfamic acid 5419-55-6,
Triisopropyl borate 5610-59-3, Silver fulminate 5637-83-2,
Cyanuric triazide 5653-21-4 5894-60-0, Hexadecyltrichlorosilane
5970-32-1, Mercury salicylate 6023-29-6 6275-02-1 6423-43-4
6427-21-0, Methoxymethyl isocyanate 6484-52-2, Nitric acid
ammonium salt, properties 6484-52-2D, Ammonium nitrate, mixts.
with fuel oils 6505-86-8, Nicotine sulfate 6659-60-5,

1,2,4-Butanetriol trinitrate 6842-15-5, Propylene tetramer
 6867-30-7, Lithium acetylide ethylenediamine complex 7304-92-9
 7332-16-3, Inositol hexanitrate 7429-90-5, Aluminum, miscellaneous
 7429-90-5D, Aluminum, alkyl derivs. 7439-90-9, Krypton,
 miscellaneous 7439-92-1D, Lead, compds. 7439-93-2,
 Lithium, miscellaneous 7439-93-2D, Lithium, alkyl derivs.
 7439-95-4, Magnesium, miscellaneous 7439-95-4D, Magnesium, alkyl
 derivs. 7439-97-6, Mercury, miscellaneous 7439-97-6D, Mercury,
 compds. 7440-01-9, Neon, miscellaneous 7440-09-7, Potassium,
 miscellaneous 7440-17-7, Rubidium, miscellaneous 7440-21-3,
 Silicon, miscellaneous 7440-23-5, Sodium, miscellaneous
 7440-28-0D, Thallium, compds. 7440-29-1, Thorium, miscellaneous
 7440-31-5D, Tin, org. compds. 7440-32-6, Titanium, properties
 7440-36-0, Antimony, miscellaneous 7440-36-0D, Antimony, inorg.
 and org. compds. 7440-37-1, Argon, miscellaneous 7440-38-2,
 Arsenic, miscellaneous 7440-39-3, Barium, miscellaneous
 7440-39-3D, Barium, alloys 7440-39-3D, Barium, compds.
 7440-41-7, Beryllium, miscellaneous 7440-41-7D, Beryllium, compds.
 7440-43-9D, Cadmium, compds. 7440-44-0, Carbon, miscellaneous
 7440-45-1, Cerium, miscellaneous 7440-46-2, Cesium, miscellaneous
 7440-55-3, Gallium, miscellaneous 7440-58-6, Hafnium,
 miscellaneous 7440-59-7, Helium, miscellaneous 7440-61-1,
 Uranium, miscellaneous 7440-63-3, Xenon, miscellaneous
 7440-66-6, Zinc, miscellaneous 7440-67-7, Zirconium, miscellaneous
 7440-70-2, Calcium, miscellaneous 7440-70-2D, Calcium, alloys
 7446-09-5, Sulfur dioxide, miscellaneous 7446-11-9, Sulfur
 trioxide, miscellaneous 7446-14-2, Lead sulfate 7446-18-6,
 Thallium sulfate 7446-70-0, Aluminum chloride (AlCl₃),
 miscellaneous 7487-94-7, Mercuric chloride, miscellaneous
 7488-56-4, Selenium disulfide 7521-80-4, Butyltrichlorosilane
 7550-45-0, Titanium tetrachloride, miscellaneous 7570-26-5,
 1,2-Dinitroethane 7572-29-4, Dichloroacetylene 7578-36-1
 7580-67-8, Lithium hydride 7601-89-0, Sodium perchlorate
 7601-90-3, Perchloric acid, miscellaneous 7616-94-6, Perchloryl
 fluoride 7631-89-2, Sodium arsenate 7631-99-4, Sodium nitrate,
 miscellaneous 7632-00-0, Sodium nitrite 7632-51-1, Vanadium
 tetrachloride 7637-07-2, Boron trifluoride, miscellaneous
 7645-25-2, Lead arsenate 7646-69-7, Sodium hydride
 RL: ADV (Adverse effect, including toxicity); PEP (Physical,
 engineering or chemical process); BIOL (Biological study); PROC
 (Process)

(packaging and transport of, stds. for)

IT 7646-78-8, Stannic chloride, miscellaneous 7646-85-7, Zinc
 chloride, miscellaneous 7646-93-7, Potassium hydrogen sulfate
 7647-01-0, Hydrogen chloride, miscellaneous 7647-18-9, Antimony
 pentachloride 7647-19-0, Phosphorus pentafluoride 7664-38-2,
 Phosphoric acid, miscellaneous 7664-38-2D, Phosphoric acid, esters
 7664-39-3, Hydrogen fluoride, miscellaneous 7664-41-7, Ammonia,
 miscellaneous 7664-93-9, Sulfuric acid, miscellaneous 7681-38-1,
 Sodium hydrogen sulfate 7681-49-4, Sodium fluoride, miscellaneous
 7681-52-9, Sodium hypochlorite 7697-37-2, Nitric acid,
 miscellaneous 7704-34-9, Sulfur, miscellaneous 7705-07-9D,
 Titanium trichloride, mixts. 7705-08-0, Ferric chloride,
 miscellaneous 7718-98-1, Vanadium trichloride 7719-09-7, Thionyl
 chloride 7719-12-2, Phosphorus trichloride 7722-64-7, Potassium
 permanganate 7722-84-1, Hydrogen peroxide (H₂O₂), miscellaneous
 7723-14-0, Phosphorus, miscellaneous 7726-95-6, Bromine,
 miscellaneous 7727-15-3, Aluminum bromide 7727-18-6, Vanadium
 oxytrichloride 7727-21-1, Potassium persulfate 7727-37-9,
 Nitrogen, miscellaneous 7727-37-9D, Nitrogen, mixts. with rare

gases 7727-54-0, Ammonium persulfate 7738-94-5, Chromic acid
 (H₂CrO₄) 7756-94-7, Triisobutylene 7757-79-1, Potassium nitrate,
 miscellaneous 7758-01-2, Potassium bromate 7758-09-0, Potassium
 nitrite 7758-19-2, Sodium chlorite 7758-94-3, Ferrous chloride
 7761-88-8, Silver nitrate, miscellaneous 7773-03-7, Potassium
 bisulfite 7775-09-9, Sodium chlorate 7775-14-6, Sodium
 dithionite 7778-39-4, Arsenic acid 7778-44-1, Calcium arsenate
 7778-54-3, Calcium hypochlorite 7778-66-7 7778-74-7, Potassium
 perchlorate 7779-86-4, Zinc dithionite 7779-88-6, Zinc nitrate
 7782-39-0, Deuterium, miscellaneous 7782-41-4, Fluorine,
 miscellaneous 7782-44-7, Oxygen, miscellaneous 7782-44-7D,
 Oxygen, mixts. with rare gases 7782-49-2, Selenium, miscellaneous
 7782-50-5, Chlorine, miscellaneous 7782-65-2, Germane 7782-78-7,
 Nitrosylsulfuric acid 7782-79-8D, Hydrazoic acid, copper complexes
 7782-99-2, Sulfurous acid, miscellaneous 7783-06-4, Hydrogen
 sulfide, miscellaneous 7783-07-5, Hydrogen selenide (H₂Se)
 7783-08-6, Selenic acid 7783-33-7 7783-41-7, Oxygen difluoride
 7783-54-2, Nitrogen trifluoride 7783-56-4, Antimony trifluoride
 7783-60-0, Sulfur tetrafluoride 7783-61-1, Silicon tetrafluoride
 7783-66-6, Iodine pentafluoride 7783-70-2, Antimony pentafluoride
 7783-79-1, Selenium hexafluoride 7783-80-4, Tellurium hexafluoride
 7783-81-5, Uranium hexafluoride 7783-82-6, Tungsten hexafluoride
 7783-91-7, Silver chlorite 7784-08-9 7784-21-6, Aluminum hydride
 7784-30-7, Aluminum phosphate 7784-42-1, Arsine 7784-46-5,
 Sodium arsenite 7786-30-3D, Magnesium chloride (MgCl₂), mixt. with
 chlorates 7787-36-2, Barium permanganate 7787-41-9, Barium
 selenate 7787-71-5, Bromine trifluoride 7788-97-8, Chromic
 fluoride 7789-09-5, Ammonium dichromate 7789-18-6, Cesium
 nitrate 7789-21-1, Fluorosulfonic acid 7789-23-3, Potassium
 fluoride 7789-29-9, Potassium bifluoride 7789-30-2, Bromine
 pentafluoride 7789-38-0, Sodium bromate 7789-59-5, Phosphorus
 oxybromide 7789-60-8, Phosphorus tribromide 7789-61-9, Antimony
 tribromide 7789-69-7, Phosphorus pentabromide 7789-78-8, Calcium
 hydride 7790-59-2 7790-69-4, Lithium nitrate
 7790-91-2, Chlorine trifluoride 7790-93-4, Chloric acid
 7790-94-5, Chlorosulfonic acid 7790-98-9, Ammonium perchlorate
 7790-99-0, Iodine monochloride 7791-10-8, Strontium chlorate
 7791-23-3, Selenium oxychloride 7791-25-5, Sulfuryl chloride
 7791-27-7, Disulfuryl chloride 7803-51-2, Phosphine 7803-52-3,
 Stibine 7803-54-5, Magnesium diamide 7803-55-6, Ammonium
 metavanadate 7803-57-8, Hydrazine hydrate 7803-62-5, Silane,
 miscellaneous 7803-63-6, Ammonium hydrogen sulfate 8004-09-9
 8006-19-7, Amatol 8006-28-8, Soda lime 8007-56-5,
 Nitrohydrochloric acid 8007-58-7 8012-74-6, London Purple
 8014-95-7, Fuming sulfuric acid 8049-17-0, Ferrosilicon
 8050-88-2, Celluloid 8063-77-2 8065-53-0, Hexolite 8066-33-9,
 Pentolite 8070-50-6 9003-53-6, Polystyrene 9004-70-0,
 Collodion 9056-38-6, Nitrostarch 9080-17-5, Ammonium polysulfide
 10022-31-8, Barium nitrate 10024-97-2, Nitrogen oxide (N₂O),
 properties 10025-78-2, Trichlorosilane 10025-85-1, Nitrogen
 trichloride 10025-87-3, Phosphorus oxychloride 10025-91-9,
 Antimony trichloride 10026-04-7, Silicon tetrachloride
 10026-11-6, Zirconium tetrachloride 10026-13-8, Phosphorus
 pentachloride 10031-13-7 10031-87-5, 2-Ethylbutyl acetate
 10034-81-8, Magnesium perchlorate 10034-85-2, Hydrogen iodide
 10035-10-6, Hydrogen bromide, miscellaneous 10039-54-0,
 Hydroxylamine sulfate 10042-76-9, Strontium nitrate 10045-94-0,
 Mercuric nitrate 10049-04-4, Chlorine dioxide 10099-74-8, Lead
 nitrate 10101-50-5 10102-06-4, Uranyl nitrate 10102-12-2,
 Selenium nitride 10102-18-8, Sodium selenite 10102-43-9, Nitric

oxide, miscellaneous 10102-44-0, Nitrogen dioxide, miscellaneous
 10102-49-5, Ferric arsenate 10102-50-8, Ferrous arsenate
 10103-50-1, Magnesium arsenate 10118-76-0 10124-37-5, Calcium
 nitrate 10124-48-8, Mercury ammonium chloride 10124-50-2,
 Potassium arsenite 10137-74-3, Calcium chlorate 10192-29-7,
 Ammonium chlorate 10241-05-1, Molybdenum pentachloride
 10256-53-8, Methanamine, compd. with trinitromethane, miscellaneous
 10294-33-4, Boron tribromide 10294-34-5, Boron trichloride
 10306-83-9 10326-21-3, Magnesium chlorate 10326-24-6
 10361-95-2, Zinc chlorate 10377-60-3, Magnesium nitrate
 10377-66-9, Manganese nitrate 10415-75-5, Mercurous nitrate
 10421-48-4, Ferric nitrate 10431-47-7 10544-63-5, Ethyl
 crotonate 11069-19-5, Dichlorobutene 11071-47-9, Isooctene
 11099-22-2 11105-16-1, Zirconium hydride 11122-26-2 11135-81-2
 11138-49-1, Sodium aluminate 11140-68-4, Titanium hydride
 12001-29-5, Chrysotile 12002-19-6, Mercury nucleate 12002-48-1,
 Trichlorobenzene 12030-88-5, Potassium superoxide 12031-80-0,
 Lithium peroxide 12033-49-7, Nitrogen trioxide 12034-12-7,
 Sodium superoxide 12057-74-8, Magnesium phosphide (Mg₃P₂)
 12125-01-8, Ammonium fluoride 12135-76-1, Ammonium sulfide
 12136-15-1, Mercury nitride 12164-94-2, Ammonium azide
 12167-20-3, Nitrocresol 12172-67-7, Actinolite 12401-70-6,
 Potassium monoxide 12401-86-4, Sodium monoxide 12427-38-2, Maneb
 12440-42-5, Tin phosphide (Sn₃P₄) 12504-16-4, Strontium phosphide
 (Sr₃P₂) 12627-52-0, Antimony sulfide 12627-52-0D, Antimony
 sulfide, mixt. with chlorates 12640-89-0, Selenium oxide
 12653-71-3, Mercury oxide 12737-18-7, Calcium silicide
 12751-03-0, Cordite 12771-08-3, Sulfur chloride 12789-46-7, Amyl
 acid phosphate 13092-75-6, Silver acetylde 13138-45-9
 13225-10-0, α -Methylglucoside tetranitrate 13319-75-0, Boron
 trifluoride dihydrate 13410-01-0, Sodium selenate 13424-46-9,
 Lead azide 13426-91-0, Cupriethylenediamine 13437-80-4, Mercuric
 arsenate 13444-85-4, Nitrogen triiodide 13446-10-1, Ammonium
 permanganate 13446-48-5, Ammonium nitrite 13450-97-0, Strontium
 perchlorate 13453-30-0, Thallium chlorate 13463-39-3, Nickel
 carbonyl 13463-40-6, Iron pentacarbonyl 13464-33-0, Zinc
 arsenate 13464-58-9D, Arsenous acid, copper complexes
 13465-73-1, Bromosilane 13465-95-7, Barium perchlorate
 13472-08-7 13473-90-0, Aluminum nitrate
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(packaging and transport of, stds. for)

IT 13477-00-4, Barium chlorate 13477-10-6, Barium hypochlorite
 13477-36-6, Calcium perchlorate 13520-83-7, Uranyl nitrate
 hexahydrate 13537-32-1, Fluorophosphoric acid 13548-38-4,
 Chromium nitrate 13597-54-1, Zinc selenate 13597-99-4, Beryllium
 nitrate 13598-36-2, Phosphonic acid 13637-63-3, Chlorine
 pentafluoride 13637-76-8, Lead perchlorate 13718-59-7
 13746-89-9, Zirconium nitrate 13762-51-1, Potassium borohydride
 13766-44-4, Mercury sulfate 13769-43-2, Potassium metavanadate
 13770-96-2, Sodium aluminum hydride 13774-25-9 13779-41-4,
 Difluorophosphoric acid 13780-03-5, Calcium bisulfite
 13823-29-5, Thorium nitrate 13840-33-0, Lithium
 hypochlorite 13840-33-0D, Lithium hypochlorite, mixts.
 13843-59-9, Ammonium bromate 13863-88-2, Silver azide
 13967-90-3, Barium bromate 13973-87-0, Bromine azide 13973-88-1,
 Chlorine azide 13987-01-4, Tripropylene 14014-86-9 14019-91-1,
 Calcium selenate 14293-73-3 14448-38-5, Hyponitrous acid
 14519-07-4, Zinc bromate 14519-17-6, Magnesium bromate

14546-44-2, Hydrazine azide 14567-73-8, Tremolite 14644-61-2,
Zirconium sulfate 14666-78-5, Diethylperoxydicarbonate
14674-72-7, Calcium chlorite 14696-82-3, Iodine azide (I(N3))
14977-61-8 15195-06-9 15245-44-0, Lead trinitroresorcinat
15347-57-6, Lead acetate 15457-98-4 15512-36-4, Calcium
dithionite 15545-97-8, 2,2'-Azodi(2,4-dimethyl-4-
methoxyvaleronitile) 15598-34-2, Pyridine perchlorate
15718-71-5, Ethylenediamine diperchlorate 15825-70-4, Mannitol
hexanitate 15875-44-2, Methylamine perchlorate 16215-49-9,
Di-n-butyl peroxydicarbonate 16229-43-9, Vanadyl sulfate
16339-86-9 16646-35-8 16721-80-5, Sodium hydrosulfide
16753-36-9, Copper acetylde 16853-85-3, Lithium aluminum hydride
16871-71-9, Zinc fluorosilicate 16871-90-2, Potassium
fluorosilicate 16872-11-0 16893-85-9, Sodium fluorosilicate
16901-76-1, Thallium nitrate 16919-19-0, Ammonium fluorosilicate
16940-66-2, Sodium borohydride 16940-81-1, Hexafluorophosphoric
acid 16941-12-1, Chloroplatinic acid 16949-15-8, Lithium
borohydride 16949-65-8, Magnesium fluorosilicate 16961-83-4,
Fluorosilicic acid 16962-07-5, Aluminum borohydride 17014-71-0,
Potassium peroxide 17068-78-9, Anthophyllite 17462-58-7,
sec-Butyl chloroformate 17639-93-9, Methyl-2-chloropropionate
17702-41-9, Decaborane 17861-62-0 18130-44-4, Titanium sulfate
18414-36-3 18810-58-7, Barium azide 19159-68-3 19287-45-7,
Diborane 19287-45-7D, Diborane, mixts. 19624-22-7, Pentaborane
20062-22-0 20236-55-9, Barium styphnate 20600-96-8 20816-12-0,
Osmium tetroxide 20820-44-4 20859-73-8, Aluminum phosphide
21351-79-1, Cesium hydroxide (Cs(OH)) 21569-01-7 21723-86-4
21985-87-5, Pentanitroaniline 22128-62-7,
Chloromethylchloroformate 22750-93-2, Ethyl perchlorate
22751-24-2 22826-61-5 23414-72-4, Zinc permanganate
23745-86-0, Potassium fluoroacetate 24167-76-8, Sodium phosphide
24468-13-1, 2-Ethylhexylchloroformate 24884-69-3 25013-15-4,
Vinyl toluene 25109-57-3 25134-21-8 25136-55-4,
Dimethyldioxane 25154-42-1, Chlorobutane 25154-54-5,
Dinitrobenzene 25155-15-1, Cymene 25167-20-8, Tetrabromoethane
25167-67-3, Butylene 25167-70-8, Diisobutylene 25167-80-0,
Chlorophenol 25168-05-2, Chlorotoluene 25265-68-3,
Methyltetrahydrofuran 25321-14-6, Dinitrotoluene 25322-01-4,
Nitropropane 25322-20-7, Tetrachloroethane 25323-30-2,
Dichloroethylene 25339-56-4, Heptene 25340-17-4, Diethylbenzene
25377-72-4, n-Amylene 25496-08-6, Fluorotoluene 25497-28-3,
Difluoroethane 25497-29-4, Chlorodifluoroethane 25513-64-8
25550-53-2 25550-55-4, Dinitrosobenzene 25550-58-7,
Dinitrophenol 25550-58-7D, Dinitrophenol, salts 25567-67-3,
Chlorodinitrobenzene 25567-68-4, Chloronitrotoluene 25639-42-3,
Methylcyclohexanol 25721-38-4, Lead picrate 25917-35-5, Hexanol
26134-62-3, Lithium nitride 26140-60-3D, Terphenyl, halo derivs.
26249-12-7, Dibromobenzene 26471-56-7, Dinitroaniline
26471-62-5, Toluene diisocyanate 26506-47-8, Copper chlorate
26571-79-9 26618-70-2 26628-22-8, Sodium azide 26638-19-7,
Dichloropropane 26645-10-3 26760-64-5, Isopentene 26762-93-6
26914-02-3, Iodopropane 26915-12-8, Toluidine 26952-23-8,
Dichloropropene 26952-42-1, Trinitroaniline 27134-26-5,
Chloroaniline 27134-27-6, Dichloroaniline 27137-85-5,
Dichlorophenyltrichlorosilane 27152-57-4 27176-87-0,
Dodecylbenzenesulfonic acid 27195-67-1, Dimethylcyclohexane
27215-10-7 27236-46-0, Isohexene 27254-36-0, Nitronaphthalene
27458-20-4, Butyltoluene 27978-54-7, Hydrazine perchlorate
27986-95-4 27987-06-0, Trifluoroethane 28260-61-9,
Trinitrochlorobenzene 28300-74-5, Antimony potassium tartrate

28324-52-9, Pinane hydroperoxide 28479-22-3 28653-16-9
28679-16-5, Trimethylhexamethylenediisocyanate 28805-86-9,
Butylphenol 29191-52-4, Anisidine 29306-57-8 29790-52-1,
Nicotine salicylate 29903-04-6 29965-97-7, Cyclooctadiene
30236-29-4, Sucrose octanitate 30525-89-4, Paraformaldehyde
30553-04-9, Naphthylthiourea 30586-10-8, Dichloropentane
30586-18-6, Pentamethylheptane 31058-64-7 31212-28-9,
Nitrobenzenesulfonic acid 33453-96-2 33864-17-4 34216-34-7,
Trimethylcyclohexylamine 35296-72-1, Butanol 35860-50-5,
Trinitrobenzoic acid 35860-51-6, Dinitroresorcinol 35884-77-6,
Xylyl bromide 36472-34-1, Chloropropene 37020-93-2, Mercury
cyanide (Hg(CN)) 37187-22-7, Acetyl acetone peroxide 37206-20-5,
Methyl isobutyl ketone peroxide 37273-91-9, Metaldehyde
37320-91-5, Mercury iodide 37368-10-8, Aluminum vanadium oxide
38139-71-8, Bromide chloride 38232-63-2, Mercurous azide
38483-28-2, Methylene glycol dinitrate 39377-49-6, Copper cyanide
39377-56-5, Lead sulfide 39404-03-0, Magnesium silicide
39409-64-8, TVOPA 39432-81-0 39455-80-6, Ammonium sodium
vanadium oxide 40058-87-5, Isopropyl-2-chloropropionate
41195-19-1 41587-36-4, Chloronitroaniline 42296-74-2, Hexadiene
43133-95-5, Methylpentane 50815-73-1 50874-93-6 51006-59-8
51023-22-4, Trichlorobutene 51064-12-1 51312-23-3, Mercury
bromide 51317-24-9, Lead nitroresorcinate 51325-42-9, Copper
selenite 51845-86-4, Ethyl borate 52181-51-8 53014-37-2,
Tetranitroaniline 53408-91-6, Mercury thiocyanate 53422-49-4
53569-62-3 53839-08-0 53906-68-6 54141-09-2, 1,4,-Butynediol
54413-15-9, Tritonal 54727-89-8 54958-71-3 55510-04-8,
Dinitroglycoluril 55810-17-8
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